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ABSTRACT

This book contains six papers: "Studying the Teachers Life and Work" (Ivor F. Goodson); "Mindful Orientation in Teachers' Pedagogical Thinking" (Jukka Husu); "The Way Thinking is Once Again" (Pertti Kansanen); "Preparing Prospective Elementary Teachers to Teach Mathematics: A Problem-Solving Approach" (Frank K. Lester, Jr. and Diana V. Lambdin); "Individual Differences in the Criteria of Optimal Readability of Textbooks" (Jan Mikk); and "The Pathic of Pedagogical Practice" (Max van Manen). (All papers contain references.) (SM)

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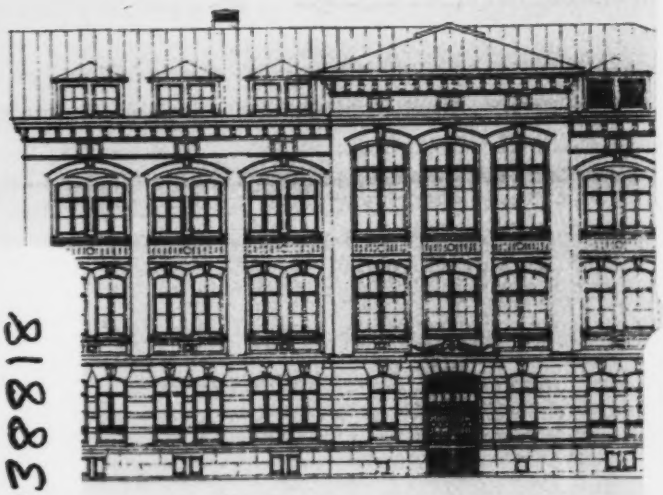
DISCUSSIONS ON SOME EDUCATIONAL ISSUES VIII

Edited by Pertti Kansanen

Department of Teacher Education
University of Helsinki



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Studying the Teachers Life and Work

Ivor F. Goodson

Teachers, Researchers and Practice

This is primarily concerned to explore the question of which strategic focus might be employed when teachers (as researchers) and externally located researchers (normally in faculties of education) collaborate. I take the view that a narrow focus on `practice' and on practical stories in collaborating on research, a panacea that is politically and academically popular at the moment, will not take us too far. A much broader focus on the teachers life and work is required and this position is advanced in this paper.

This is for two main reasons: Firstly, practice is a good deal more than the technical things we do in classrooms—it relates to who we are, to our whole approach to life. Here I might quote C. Wright Mills talking about scholars but it's as relevant to any member of the social scientific community. He said "the most admirable thinkers within the scholarly community...do not split their work from their lives. They seem to take both too seriously to allow such disassociation, and they want to use each for the enrichment of others". (Mills, 1959, pp. 195–196) So I would want a form of research which links the analysis of the teacher's life and work together. Secondly, the interactive practices of our classrooms are subject to constant change often in the form of new government guidelines, initiatives such as, in Ontario at the moment, destreaming. These initiatives outside the classroom, what I call *preactive* actions, set crucial parameters for interactive classroom practice. Preactive action effects interactive possibilities. In their collaborative research, teachers as researchers and external researchers need to focus on both the preactive and the interactive. What this means in short is that we need to look at the full context in which teacher's practice is negotiated, not just at interaction and implementation within the classroom. If we stay with the focus on practice then our collaborative research is inevitably going to largely involve the implementation of initiatives which are generated elsewhere. That in itself is a form of political quietism.

To avoid this fate, the preferred value position of this chapter comes close to that of the teacher as a researcher. But even the 'teacher as researcher' slogan, whilst it carries the essence of my value position, seems to me to carry a number of problems. Firstly, in implying that the teacher becomes the researcher of her or his own practice, it frees the researchers in the academy from clear responsibility in this process. On the contrary, I think such people have a primary, and much neglected, responsibility for complementing and sustaining the teacher as researcher.

Associated with this I am against the notion that the focus of the teacher as researcher should be mainly upon practical knowledge and practice-based stories: an assumption in a good deal of the literature in this area. I am opposed to this assumption because the parameters to practice whether they be biographical or political cover a very wide terrain. To narrow the focus to 'practice as defined' is to make the focus of research a victim of historical circumstances, particularly political tendencies. At the moment, the New Right is seeking to turn the teacher's practice into that of a technician, a routinized and trivialised deliverer of predesigned packages. To accept those definitions and to focus on 'practice' so defined is to play into their hands.

The teacher as researcher of practice will ideally seek to critique and transcend such definitions of practice. But, and this is a crucial limitation, by focusing on practice in this way, the initiative for defining our starting point passes to politicians and bureaucrats. In short they will retain the power of agenda setting. It would, I think, sponsor more autonomous and critical research if we adopted a wider lens of inquiry for studying the teacher's life and work.

The focus on practice, or practical knowledge, on teachers' voices and stories has coincided with a period of conservative restructuring of schooling. As long as this focus remains decoupled from analysis of this restructuring, the two initiatives make reasonable bedfellows. So, on the one hand powerful interest groups restructure schooling and practice, on the other hand teachers are given a voice to comment on their practical knowledge. Practice is restructured at the point at which it is allowed a voice. Voice and story which celebrates only practice creates valuable covering noise, apparently quite emancipatory noise, whilst that very practice is narrowed and technicised.

Studying The Teachers Life and Work

So you may say: "I am a teacher who tells stories, that ignore social context". So what! I can see that's a theoretical problem for an educational scholar like you. Why should I worry—"They're still good stories".

The reason is that stories do social and political work as they are told. A story is never just a story - it is a statement of belief, of morality, it speaks about values. Stories carry loud messages both in what they say and what they don't say. They may accept political and social priorities without comment, or they may challenge those priorities.

Why would teachers' stories, particularly those directed to the personal and practical aspects of their work, be such a problem. Educational scholarship notwithstanding why would such teachers' stories be a problem for teachers generally? How can giving someone a voice, so long silenced, be anything but a good thing?

Let us briefly review some of the changes currently going on in the teachers life and work. Then let us see how stories of the personal and practical knowledge of teachers respond to such change. How in short do personal and practical teachers' stories respond to the forces that construct their work?

Martin Lawn (1990) has written powerfully about teachers' biographies and of how teachers' work has been rapidly restructured in England and Wales. The teacher he argues has moved from 'moral responsibility' particularly with regard to curricular matters to a narrow technical competence. Teaching in short has had its area of moral and professional judgement severely reduced. He summarizes recent changes in this way:

> In the biographies of many teachers is an experience of, and an expectation of, curriculum responsibility not as part of a job description, a task, but as part of the moral craft of teaching, the real duty. The post-war tradition of gradual involvement in curriculum responsibility at primary and second level was the result of the wartime breakdown of education, the welfare aspects of schooling and the post-war reconstruction in which teachers played a pivotal, democratic role. The role of teaching expanded as the teachers expanded the role. In its ideological form within this period, professional autonomy was created as an idea. As the post-war consensus finally collapsed and corporatism was demolished by Thatcherism, teaching was again to be reduced, shorn of its involvement in policy and managed more tightly. Teaching is to be reduced to 'skills', attending planning meetings, supervising others, preparing courses and reviewing the curriculum. It is to be 'managed' to be more 'effective'. In effect the intention is to depoliticize teaching and to turn the teacher into an educational

> worker. Curriculum responsibility now means supervising competencies. (Lawn, 1990, p. 389)

Likewise Susan Robertson (1994) has analysed teachers' work in the context of post-fordist economies. She argues that again the teachers' professionalism has been drastically reconstructed and replaced by a wholly 'new professionalism'.

> The new professionalism framework is one where the teacher as worker is integrated into a system where there is (i) no room to negotiate, (ii) reduced room for autonomy, and (iii) the commodity value of flexible specialism defines the very nature of the task. In essence, teachers have been severed from those processes which would involve them in deliberations about the future shape of their work. And while many teachers are aware that change is taking place and talk of the "good old days", few are aware of the potential profundity of that change even when it is happening in their midst. Clearly educators have been eclipsed by a core of interests from the corporate sector and selected interests co-opted in the corporate settlement. (Robertson, 1994)

Teachers personal and practical stories typically relate stories about their work and practise. So stories in the new domain described by Lawn and Robertson will be primarily stories about work where moral and professional judgement plays less and less of a part. Given their starting point such stories will speak about that which has been constructed. By focusing on the personal and practical such teachers' stories forgo the chance to speak of other ways, other people, other times and other forms of being a teacher. The focus on the personal and practical teachers' stories is then an abdication of the right to speak on matters of social and political construction. By speaking in this voice about personal and practical matters the teacher both loses a voice in the moment of speaking. For the voice that has been encouraged and granted, in the realm of personal and practical stories, is the voice of technical competency, the voice of the isolated classroom practitioner. The voice of 'ours not to reason why, ours but to do or die'.

In studying the teachers life and work in a fuller social context the intention is to develop collaboratively insights into the social construction of teaching. In this way, as we noted earlier, teachers stories of action can be reconnected with 'theories of context'. Hence teaching stories rather than passively celebrating the continual reconstruction of teaching will move to develop understandings of social and political construction. It is the move from commentary on what *is*, to cognition of what *might be*.

Studying the teachers life and work as social construction provides a valuable lens for viewing the new moves to restructure and reform schooling. Butt *et al.* (1992) have talked about the 'crisis of reform' when so much of the restructuring and reformist initiatives depend on prescriptions imported into the classroom but developed as political imperatives elsewhere. These patterns of intervention develop from a particular view of the teacher, a view which teachers' stories often work to confirm.

> All their lives teachers have to confront the negative stereotypes—'teacher as robot, devil, angel, nervous Nellie'—foisted upon them by the American culture. Descriptions of teaching as a 'flat occupation with no career structure, low pay, salary increments unrelated to merit' have been paralleled with portrayals of teaching as 'one great plateau' where 'it appears that the annual cycle of the school year lulls teachers into a repetitious professional cycle of their own'.
>
> Within the educational community, the image of teachers as semi-professionals who lack control and autonomy over their own work and as persons who do not contribute to the creation of knowledge has permeated and congealed the whole educational enterprise. Researchers have torn the teacher out of the context of classroom, plagued her with various insidious effects (Hawthorne, novelty, Rosenthal, halo), parcelled out into discrete skills the unity of intention and action present in teaching practices. (Butt *et al.*, 1992, p. 55)

In some ways the crisis of reform is a crisis of prescriptive optimism—a belief that what is politically pronounced and backed with armouries of accountability tests will actually happen. I have recently examined the importance and salience of the belief in curriculum as prescription (CAP):

> CAP supports the mystique that expertise and control reside within central governments, educational bureaucracies or the university community. Providing nobody exposes this mystique, the two worlds of 'prescriptive rhetoric' and 'schooling as practise' can co-exist. Both sides benefit from such peaceful coexistence. The agencies of CAP are seen to be 'in control' and the schools are seen to be 'delivering' (and can carve out a good degree of autonomy if they accept the rules). (Goodson, 1990, p. 299)

However, there is a substantial downside to this 'historic compromise':

> There are costs of complicity in accepting the myth of prescription: above all these involve, in various ways, acceptance of established modes of power relations. Perhaps most importantly the people intimately connected with the day-to-day social construction of curriculum and schooling—teachers—are thereby effectively disenfranchised in the 'discourse of schooling'. To continue to exist, teachers' day-to-day power must remain unspoken and unrecorded. This is one price of complicity: day-to-day power and autonomy for schools and for teach-

> ers are dependent on continuing to accept the fundamental lie. (Goodson, 1990, p. 300)
>
> "In addressing the crisis of prescription and reform, it becomes imperative that we find new ways to sponsor the teacher's voice". (Goodson, 1990, p. 12)

The challenging contextual insights which come from studying the teachers life and work in a collaborative manner can be eloquently instanced in some of the work of Kathleen Casey (1992). Take for instance her study of the reasons why progressive women activists leave teaching. She notes from the beginning that many of the more conventional studies work from a functionalist managerial perspective:

> "A certain set of taken-for-granted assumptions control the way in which the problem of teachers attrition has normally been defined, one which presumes managerial solutions. Inquiries have generally been oriented by administrative demands for a stable workforce." (Casey, 1992, p. 187)

Casey (1992) decided to develop life history narratives of contemporary women teachers working for social change. She tape-recorded thirty-three such narratives in five American cities in 1984-5. In studying teacher attrition she notes the broad range of taken for granted assumption which go beyond the mere definition of the problem. "A limited number of research strategies have been employed in investigating this topic. Former members of the teaching profession have often been traced statistically, rather than in person, and information has typically been collected from such sources as district files, state departments of public instruction, or through research-conceived survey".

The subject then has either been scrutinized at statistical distance or by employing data collected 'from above' and beyond the teachers themselves. In effect the teachers voice has been silenced and the research paradigms employed have confirmed and echoed that silence.

> The particular configuration of selectivities and omissions which has been built into this research frame slants the shape of its findings. By systematically failing to record the voices of ordinary teachers, the literature on educators' careers actually silences them. Methodologically, this means that even while investigating an issue where decision-making is paramount, researchers speculate on teachers' motivations, or at best, survey them with a set of forced-choice options. Theoretically, what emerges is an instrumental view of teachers, one in which they are reduced to objects which can be manipulated for particular ends. Politically, the results are educational policies constructed around institutionally

> convenient systems of rewards and punishments, rather than in congruence with teachers' desires to create significance in their lives. (Casey, 1992, p. 188)

Teachers attrition when seen from the perspective of women teachers life histories comes to be seen as something growing from the life and work and social context of teaching.

> Teaching takes on a distinctive meaning in these narratives; it becomes much more than the paid employment for classroom work in a specific school. Many women define being a teacher as a fundamental existential identity. When she was unable to get a teaching job, one woman explains, 'I cried and cried because I was really upset. You know, I wanted some meaning to *my* life, and some meaning for having gotten that education.' Another woman mourns the loss of her profession in this way: 'I'm a teacher at heart. I will *always* be a teacher. And I miss teaching. I miss teaching.' (Casey, 1992, p. 206)

Casey (1992) notes that the women in question celebrate an 'ethos of nurturance and growth'—"a 'tendency' which is discouraged by the management structure". She also notes that a "major explanation" for teachers attrition is in fact the antagonism between teachers and administrators.

When seen through the perspective of womens life histories 'teachers attrition' can be seen conversely as teachers liberation from 'the conditions under which these women have laboured'. In this case they miss teaching and their work with children but the social context of teaching and politics of administrative hierarchy means that many of them move gladly to the range of "positive alternatives they have chosen". (Casey, 1992, p. 207)

Louis Smith and his colleagues (1992) chose to study educational innovation over the fifteen years of Kensington School through the life history approach. Their justification turned on reintroducing 'the person' in this case the teachers' into the assessment and analysis of educational innovation.

> It seems self-evident that the 'person' is an important item in any description and analysis of educational innovation. Some analytic accounts have minimized this aspect of innovation. We believe the excerpts raise a major sub-issue in the nature of the conceptualization of the person in the study of innovation. ... It has to do with the kind of personality theory to which students of innovation appeal. At times we feel we are beating the proverbial dead horse to note that the substance of the theory we have been developing is a far cry from the dominant behaviourist view in much of the innovation literature, in much of educational psychology, and in much of the educational research community. Behavioural objectives, time on tasks, mastery learning, school effectiveness, are sounds that emanate from drums and drummers distant from the language and perspectives

> of the innovators we have studied and the language and theory in which we have chosen to couch our own interpretations and speculations. (Smith *et al.*, 1992, p. 158)

Once again then life history study helps to reformulate our understandings of innovation in education. Before these have been seen as primarily technical or political processes. Smith *et al.* (1992) shows how "there are personality processes at work as well". Hence they argue "now when we think of school improvement we have a conception which we can use to approach any proposal for change. That seems useful for consultants asked to help, for administrators who are pushing an agenda, and for teachers who may be less than willing actors if not pawns in the process of school improvement and educational change" (Smith *et al.*, 1992, p. 165). Smith's work provides life history portrayals of teachers, worked into a broad contextual understanding of the school what he calls with admirable grandeur a 'nested systems model'. We capture then how teacher life histories are lived out within, and constantly reformulate and reconstrue, the social contexts of schooling.

This capacity to reformulate and reinterpret the prescribed agendas of schooling is often captured in the detailed life history portrayal of teachers at work in their classroom context. An example is the study by Butt et al of Glenda—at the time teaching English at the International School of Islamabad. In this life history portrayal we see how she grows confident enough to reach the stage when she can go beyond what is prescribed with confidence and competence. When her class discussions really take off and engage her children:

> "The teachers guide was closed and the students' workbooks were returned to the bookroom. The culture and knowledge within the classroom was infinitely more exciting". (Smith *et al.*, 1992, p. 84)

Butt *et al.* (1992, p. 89) cryptically notes "in our future work with other biographies it will be interesting to investigate the role of curriculum guidelines in the worklife of teachers". By situating that inquiry within 'the worklife of teachers' we can see how life history work develops its own momentum in the search for theories of context in teachers' working lives.

Conclusion

If your worldview as expressed in stories is primarily personal and practical—you are accepting a definition of yourself as you speak. The story that is told thereby acts as an agency which individualizes and practicalizes the teacher as cultural worker. We see then how the paradox of teachers' voice resolves itself.

Teachers personal and practical stories and voices are being encouraged at a time when more and more teachers are being held accountable and having their work prescribed, interrogated and evaluated. At first sight this seems paradoxical—two movements running in a different direction.

In the event this is not the case both movements may play the same role of narrowing the teachers' area of professional competence and judgement, of social and political outreach.

This pendulum swing towards teacher's stories actually comes at a somewhat unpropitious time in my view. It sets up one of the *paradoxes of postmodernism*: that at precisely the time teachers are being "brought back in", their work is being vigorously restructed. Teachers voices and stories are being pursued as *bona fide* reflective research data at a time of quite dramatic restructuring. In fact, at precisely the time the teacher's voice is being pursued and promoted, the teacher's work is being technised and narrowed. As the movement grows to celebrate teachers knowledge, it is becoming less and less promising as a focus for research and reflection. As teacher's work intensifies, as more and more centralised edicts and demands impinge on the teacher's world the space for reflection and research is progressively squeezed. It is a strange time then to evacuate traditional theory and pursue personal and practical knowledge.

A promising movement might then throw the "baby out with the bathwater". At a time of rapid restructuring, the timing of these moves seem profoundly unfortunate. To promote stories and narratives, without analysis of structures and systems, shows how the best of intentions can unwittingly complement the moves to uncouple the teacher from the wider picture. Stories and narratives can form an unintended coalition with those forces which would divorce the teacher from knowledge of political and micropolitical perspective from theory, from broader cognitive maps of influence and power. It would be an unfortunate fate for a movement that at

times embraces the goal of emancipating the teacher to be implicated in the displacement of theoretical and critical analysis.

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Mindful Orientation in Research of Teachers' Pedagogical Thinking

Jukka Husu

Introduction

The 1990's has been an era of both individual and team-based pedagogical action—at least in the Scandinavian countries. In Finland the general curricular frames have been abandoned to a great extent and now they are being replaced by local and school-centred curricular guidelines. Teachers are at the centre of this educational enterprise: it is their professional task, both individually and collectively (as a school community), to shape the school-centred curricula according to their best professional understanding and capability. The duty is a challenging one because it covers the totality of the educational processes from classroom practices to general educational aims and goals and to the special characteristics the schools are aiming at.

The change taking place in the teaching profession can be viewed as a two-fold transformation. The first one means the shift of administrative power from the general and bureaucratic (macro) level to the practical and local school level. This change taking place in educational policy coincides with the second transformation in which the teacher's professional role is changing from being the implementor of general curricular guidelines to being the inventor of more personal and situation-specific approaches in teaching. Together these two transformations mean the empowerment of teachers in the sense that, from now on, teachers are more responsible for the totality of the instructional process taking place in schools.

The situation can be seen as a sort of testing ground for teachers' pedagogical capabilities to cope with professional issues on both the practical and intellectual levels at the same time, and at the same place, on the school level. Teachers are becoming active curriculum makers instead of passive curriculum users (Clandinin & Connelly, 1992).

The situation can also be described as contextual and integrated. The situation is contextual in the sense that teachers work in their schools and classroom settings where changes are taking place. Teachers' work is situ-

ated—that is, it takes place in institutions, cultural and social fields, and in response to individual and social pressures that are often unrepeatable. The prevailing situation can be regarded as integrated in the sense that teachers, both factually and now also officially, have to take care of and take into consideration the totality of the instructional process they intend to perform. As Whitehead (1995) has presented; teachers' simultaneously need both the practical capacities to engage in educational processes and the theoretical capacities to relate their educational actions to educational theories, or even produce their own living educational theories.

The restructuring of school curricula and pedagogical practices are of little value if they do not take teachers into account. Teachers do not merely deliver the curriculum. As mentioned, their professional tasks now also encompass the developing and redefining of the curriculum. It is what teachers think, what teachers believe and what teachers do at the classrooms level that ultimately shapes the kind of education young people get.

Research on Teachers' Thinking—Practice and Beyond

A great deal of inservice training, but also formal teacher education too, is devoted to transmitting to teachers knowledge and skills of various kinds. When this is done well, teachers should be enlightened and more capable of performing their educational tasks. According to this "hard ground" agenda, the problem is getting teachers to see this. If the solution doesn't work, there exists a tendency to suppose that something is wrong with the practioners. By practioners is meant not only teachers, but also teacher educators, and other authoritative representatives of the educational sciences, as well as various consultants working in the field on a commercial basis. It is their task to solve persisting pedagogical problems by possessing the adequate and accurate knowledge needed. Furthermore, these authoritative knowledge holders must also be capable to passing this knowledge to its users in such a form that it can be reinterpreted and used in an appropriate way. However, for some reason, not too many users know how to use/implement their knowledge in the various practical contexts they face.

In recent years, we have come to realize that teachers are the ultimate key to educational change and school improvement. All our efforts to restructure schools or to reshape the composition and the contents of curriculum are of little value if we do not take teachers into account. Teachers

don't just teach at schools; it is the teachers that mostly make the schools. To a great extent, they also define schools, develop schools, and (re)-interpret schools. In this vein, it is what ,and especially how, teachers think, believe, and do at the level of classroom that ultimately shapes the kind of learning that pupils get. Growing appreciation of this educational reality has placed working with teachers, and understanding teaching, at the top of many research and educational improvement agendas.

We have become aware that developing teachers and improving their teaching involves more than giving them practical advice and appropriate techniques. It is recognized that, for teachers, what goes on inside classrooms is closely related to what goes on inside and outside of schools, and, to how all this gets interpreted in teachers' knowing minds. Teachers' professional development is closely tied up with themselves both as persons and as professionals. As Sykes (1996, p. 466) puts it: teachers' professional development is closely tied to, "a low-lying swamp of messy problems, persisting dilemmas, and perennial problems for which no evident technical knowledge exists".

According to the "soft ground" agenda of teachers' professional development, teaching acts are a complex of many issues including practical wisdom, and are related to contexts and situations through the individuality of the teacher. The practice of teaching means understanding specific cases and unique situations. In a teacher's thinking, this understanding is mainly formulated in concrete and context-related terms. Practical knowing deals with lived experiences, and its statements are essentially perceptual rather than of conceptual. Their ultimate appeal is to perception, 'What is perceived?', and to action, 'What is done, and how?' As Gudmundsdottir (1991) emphasizes, "ways of seeing are ways of knowing". If so, how have we "seen" teachers and "known" their work, teaching.

Conceptions of Teachers

Clark (1986, pp. 8-9) has traced the past development of teacher thinking research and has found three interconnected and partly overlapping phases in the conceptual development in research on teachers' thinking:

1) The teacher as a decision-maker, in which the teacher's task is to diagnose needs and learning problems of students and to prescribe effective and appropriate instructional treatments for them. The teacher is seen as a sort of physician who operates in a bounded rational

world of education by defining problems and seeking satisfactory solutions to them.

2) The teacher as a sense-maker, in which decision-making is seen as one among several activities teachers perform in order to create meaning for themselves and their students. The teacher is seen as a reflective professional (Schön, 1983). Clark (1986, p. 8) sees this as a move towards a more abstract conception of a teacher in which primarily a diagnostic-prescriptive way of thinking is accomplished by a more general view of teaching as a profession that calls for extensive knowledge of teaching and student learning. It is assumed that reflectively, a professional teacher can interpret, adapt and skillfully apply his/her knowledge to particular situations in which s/he performs.

3) The teacher as a constructivist, who continually builds and elaborates his/her personal theory of teaching and education. This third phase means the widening of teachers' problem space: no more do we believe that teachers solely can define and resolve problems they encounter in their profession. Powerful influences beyond the control of individual teachers also create problems teachers have to live by. No longer is teachers' thinking seen as a monolithic and consistent issue that leads the life of teachers. Instead, it is admitted that teachers often hold multiple and conflicting theories and explanations about teaching and, as Clark (1986, p. 9) emphasizes, the amazing thing is that this kind of "inconsistent, imperfect and incomplete way of thinking" works rather well in the complex and practical world of classrooms.

Bruner (1990, p. 4) has criticized the cognitive-constructivistic approach that its emphasis has shifted from meaning to information, from the construction of meaning to the processing of information. He argues that computing has become the model of the mind and due to this the concept of computability has replaced the concept of meaning in a broad cultural sense. According to Bruner (1990, p. 8), there exists a danger that there are fewer places for the mind in our cultural systems—the mind in the intentional states like believing, desiring, intending and grasping a meaning.

Perhaps we are moving towards some kind of mindful orientation (van Manen, 1991a, p. 149) in the research on teachers' thinking. This

trend does not primarily deal with single and discernible thought traits. Instead, it presupposes that "global assessment comes first" (Jackson, 1992, p. 407) than more easily distinct thought habits. This kind of thoughtfulness is concerned with relationships that can be sketched out in teachers' thinking.

During this decade teachers' minds, in the moral and ethical sense, have become of major interest (cf. e.g. Goodlad, Soder & Sirotnik, 1990; van Manen, 1991b; Sockett, 1993; Hansen, 1993; Oser, 1994a). The concept of virtue has reappeared both in philosophical (MacIntyre, 1985) and educational writings (cf. e.g. Buchmann, 1990; Fenstermacher, 1990; Elbaz, 1993; Hansen, 1994; van Manen, 1994), and it has its critics, too (e.g. Fenstermacher, 1994a). Perhaps this can be interpreted as a fourth phase of teacher conceptions in research on teachers' thinking: the teacher is seen as a meaning-maker who aims at shaping and influencing what students become as persons when living through pedagogical situations in schools and classrooms.

In sum, as Clark (1986, p. 9) points out, in teacher thinking research we have moved away from internally consistent and mechanical paradigms towards more inconsistent, imperfect and incomplete ways of thinking. We are moving towards an understanding that what goes on inside classroom walls (and particularly inside teachers' heads) is closely related to what goes on outside those walls (and outside teachers' heads). We are also recognizing that teachers' professional thinking cannot be described solely through cognitive perspectives.

Conceptions of Students

During the three phases our way of thinking about students has also evolved. In his analysis Clark (1986, p. 9) tends to overstate when he argues that during the last few decades students were regarded as objects to be acted upon by teachers. His argument that students were seen as passive and merely as sources of clues for the teachers' own behaviour seems to be exaggerated. When looking back, the cultural image of schooling and teaching could have been like that, but it is important to note that the actual pedagogical practicies that took place in the past perhaps were not so different from the present ones. The context of interpretation (cf. Seddon, 1994) has changed. And this change has caused students to gradually come more to the forefront in educational studies. They are recognized as part-

ners in the educational process because students, like teachers, are seen as thinkers, planners, and decision makers themselves.

Shulman and Carey (1984) have analysed different conceptions of students as learners in various educational perspectives. According to them, rather than presenting students as objects, passive recipients of teaching, gradually they are considered as individuals that actively make use of their own cognitive strategies and their previous knowledge base. In this view, students are seen as active, inventive, knowledge bearing, and seif-conscious. This is in accordance with our critical remarks concerning the role of the student learner, who has been transformed from being passive recipient of teaching in to an active meaning-maker. This means that students as learners not only find out what is sensible in teaching, they actively make sense of their own studying. They have their own perspective on teaching, a studying perspective, which can be different from the one the teacher is intended to communicate. In short, students are constructivists, too.

Gradually, the view of individual student learning is giving way to a more dynamic and social view of students who also learn from each other. This kind of constructivistic view of student actitivies is consistent with the ideas of social education, which largely have been absent from the scene of educational thinking—but not from pedagogical practices. Shulman & Carey (1984, p. 517) have suggested that we should view students more as collectively rational. That is, how students exercise their abilities in groups and how they pursue their multiple and perhaps mutually-shared goals. Studying in groups calls for students who are capable of cordinating their individual work with their peers and to understand how different individuals can contribute to the group's efforts.

Student learning, as collectively rational, emphasizes that the ability to work/study as a member of a community is a contingent part of student learning. The view emphasizes that students are no longer viewed as individual and isolated objects of teaching, but rather as active members of the instructional process In sum, students' studying efforts are seen as multidimensional and embedded in various contexts, and based on understandings between both parties involved, i.e. teachers and students.

Conceptions of Context

Side by side with this conceptual development in the research of teacher thinking, the context of teaching has also been broadened. At first the unit of teacher thinking was the school classroom where the teacher's constant decision-making was taking place in order to diagnose and help student learning.

Gradually the notion of context has become more dynamic and collectively defined. The context was not seen as totally predetermined and fixed, instead it was based on a mutually-negotiated understanding between both parties involved, i.e. teachers and students (Clark, 1986; Erickson, 1986). The school classroom, and the teacher in it as the unit of analysis, was shattered e.g. by Jackson (1966; 1968). Those complexities that are nowadays being regarded as some sort of basic knowledge in the field are eloquently presented by him: *The way teaching is* in the school context.

Clark (1986, p. 12) summarizes that we have moved away from a rather impoverished and fragmented notion of context as a collection of background variables, to a richer, more dynamic, and collectively defined understanding of context. Context is not a variable, or a collection of more or less mechanical components, that lies outside of the object of interest. Teachers and teaching in schools are embedded by the surrounding world and they are also affected by it.

Seddon (1995) has analyzed different conceptions of context in educational literature, covering different methodological approaches. According to him, the most common conception of context rested upon an "inside/outside" metaphor. Mainly the context was regarded as external reality, the source of "outside" influences that tended to disturb whatever was important "inside" the object of interest. This conception has lead to the stripping of context from the object or event of interest.

Constructivistic notions of student learning and action have paved the way to more extended views of context. Instead of "outside/inside" metaphors, context is seen both as actual and symbolic: it is a field for action and the medium within which individuals construct their understandings of the situations. For pedagogical practices this extended view of contextuality is worth noting. The stance emphasizes that both the actions taken and the symbolic constructs made inform each other, comprising a larger whole. Indeed, the term context comes from latin *contextus*, which means "a joining together" (Goodwin & Duranti, 1992, p. 4). Albeit, teach-

ers and students interact with their contexts in order to create multiple/mutual understandings which inform their action in and on the world.

Seddon (1994, pp. 36-37) speaks about "practice-based" contextualism in which the relationship between the context and its objects is understood as a kind of ongoing, immensely complex cultural encounter in which:

> "there is nothing essential about context or its objects. We 'chunk' up the world as a basis for research and everyday practice. But this chunking is a methodological procedure shaped by distinctive frames of explanation, both formal and informal. There is no such thing as an unproblematic phenomenon such as 'education', 'school', or 'individual' that can be simply observed and understood." (Seddon, 1995, p. 401)

Why is context, and the way it is used, significant today? According to Seddon (1995, p. 401), it is because the modern changing of schooling is greatly a contextual change. It implies that the face-to-face relationships of teachers and students are not changing, nor that the teaching/studying practices around those relationships are very different from that from those of the past, but that the milieu within which educational practice occurs is shifting greatly. For example, the emergence of virtual classrooms (cf. e.g. Tiffin & Rajasingham, 1997; Husu, 1996; Falck *et al.*, 1997) calls for new methods in teaching and studying, as well as novel ways of thinking about the whole instructional process taking place in schools.

The context of education is no longer something that can be taken for granted, merely as a background for something else that is important. Instead, context is brought to the forefront of educators' attention. Therefore, to a great extent, it is the context that defines what is real and what is relevant from the perspectives of teachers and students, albeit researchers.

When context is understood as interpretative and discoursive practice that constitutes the real and relevant, what emerges is the fluidity of context. Context appears subjective, the reality from the perspective of participants in any setting. This kind of interpretative approach makes an ontological claim first. It infers that our being and acting in our contexts is interpersonal and shares our cultural manners. The perspective implies that our ways of relating to the world/contexts are primarily not ways of thinking, but ways of being. It is a question of relating to the totality of things that shape our thinking. And this totality may not be reduced to partucular units of thinking. Packer and Winne (1995, p. 20) see that contextuality in

teachers' thinking can be seen in the thinking itself as a joint function of (1) what is in the context, and (2) what teachers' are capable to recognize and perceive about that context.

However, these idiosyncratic features of individually-experienced contexts should not be overstated. This because, even if individual teachers are each differently positioned, they also act within commonly-experienced social and institutional settings. These settings have a long history and have relatively-stable social effects that are rooted in their contemporary practices. Consequently, while there are changes and emerging challenges, there are also continuities that structure the practice.

In sum, if context is understood as practice-based, the challenge is not to identify a tiny piece of reality to study by choosing a small topic. Rather, as Seddon (1995, p. 403) argues, the challenge is to construct a frame for analysis and explanation that enables us to grasp significant aspects of education and to make explicit the ways of seeing and interpreting them.

Knowledge Teachers Live By

The title is borrowed from Buchmann (1987), who sees that it is unclear whether much of what teachers know is professionally-special to them. Special in the sense that the knowledge teachers employ can be considered highly different by character or degree from ordinary knowledge or common sense. This is because people acquire knowledge by taking part in various cultural patterns. Such participation allows them to become members of various groups and to perform respective social roles within them.

Education and schooling are such cultural patterns, while teaching and studying are pervasive activities that teachers and students respectively perform. Every teacher has been a student at some time. In practice, this meant a tight schedule of watching and hearing teachers and fellow students approximately five hours a day, five days a week, for twelve years. Lortie (1975) calls this "the apprenticeship of observation", which gives future teachers, as well as other fellow citizens, a close-up and extended view of what it is to be a teacher or a student.

It follows, as Buchmann (1987, p. 152) argues, that the knowledge base of teaching will not be considered special and that adults on both sides, teachers and parents, will be ambivalent about its real value. Teach-

ers feel entitled, but also forced, to use their common sense in teaching. However, this does not mean to belittle professional knowledge of teachers that evidently exists and is widely discussed (e.g. Carlgren & Linblad, 1991; Russel & Munby, 1991; Fenstermacher, 1994b; van Manen, 1995, Clandinin & Connelly, 1995). The point is just to suggest that the knowledge teachers use cannot be placed on either side of the divide between "specialized knowledge which particular individuals need in their occupational roles and common knowledge which all adult individuals need as members of the community" (Znaniecki, 1965, p. 25 in Buchmann, 1987, p. 152).

Relational Knowing

Teaching is embedded in practical actions. It is situated in and between teachers and students. Teachers cannot help but stand in relation to their students. Van Manen (1994a) argues that this pedagogical relation largely depends on qualities or virtues that the teacher has been able to develop and internalize as part of his/her person. The concept of pedagogy is used in order to capture that great variety of elements in teachers' thinking. It focuses the attention on the scope of pedagogy concerned with the domain of relations between teachers and students. According to van Manen (1991b), being pedagogical means going beyond mere teaching to encompass all kinds of encounters where teachers can contribute to their students upbringing.

Teachers' pedagogical minds are approached from two perspectives: the perspective is internal when it deals directly and explicitly with pedagogical practice itself, and external if it concerns educational matters but refers to actual pedagogical practice only indirectly or implicitly. When doing this it is hoped that the pedagogical split vision (Fritzell, 1996) can be avoided. It means that there has been a tendency to use either the internal or external perspective exclusively, as if the other did not exist. However, the understanding of teachers' thinking requires a comprehension of pedagogical practice in terms of the concrete interrelations of individuals and their embeddedness in their contexts.

Defined this way, the pedagogical approach emphasizes that a teacher's knowing mind is interrelated and contextual. However, we must simultaneously acknowledge that pedagogical relationships between teachers and students are not symmetrical. Teachers are mainly responsible for

the pedagogical relationships which occur in schools. Therefore, it is important to study them.

Interrelating Cultures

Olson (1988) has criticized the research on teachers' thinking as relying too much on the cognitive perspective. By cognitive perspective he means the idea that teachers and teaching are adequately understood in terms of a person's cognitive contents and capacities. The trouble is that this view has important limitations. What is crucial in understanding a teacher's thinking is not a teacher's personal and private affairs, but rather what is interpersonal and common in them. Teachers and their thinking are parts of a bigger picture: a culture which provides a forum for negotiating meaning and for explicating action. Bruner's (1996) emphasizes that it is the culture that shapes our minds, it provides us with the toolkit by which we construct not only our worlds but our own conecptions of our selves and our capabilities.

Thus, characterizing teachers' thinking as their personal capacities easily leaves aside the curricular frame factors in which teachers operate: schools, classrooms and the overall environment in which they and their students act. As Olson argues (1992, p. 17), this social context of action is not teachers' personal property. Rather, it is out there as an interpersonal domain that vastly constitutes both teachers' professional practice and their thinking. Consequently, what teachers tell about their practice to a great deal is a reflection of their culture, and cannot be properly understood without reference to that culture (Olson, 1988, p. 169). Teachers' thinking reflects the understanding of the culture which they belong to. The personal component emerges from the fact that it is the individual teacher's construction of what is essentially public. Bruner (1996, p. x) talks about cultural "situatedness" of all mental activity meaning that we cannot understad mental activity unlees we take into account the cultural setting and its resources, the very things that give mind its shape and scope.

The attempt to understand culture and its meaning in teachers' thinking is not to seek causal relationships, but rather to pursue a context within which those relationships can be intelligibly described. When studying teachers' thinking, we need an understanding of various contexts teachers live by, in order to make sense of their thinking and action. Accordingly, when interpreting teachers' thinking, we need to employ wider

perspectives that have the capacities to give us a more coherent and complete picture of their minds. As Ryle (1949, p. 32) has put it:

> "'Intelligent' can't be defined in terms of 'intellectual'. ... When I do something intelligently ... my performance has a social procedure or manner, not special antecedents."

Harrison (1978, p. 45) echoes the same thought in his phrase: "when someone acts intelligently, he acts his mind". What does this mean? Van Manen (1991a, p. 206) reminds us of the etymological connection between thought and mind. According to him (ibid.), the word mind shares roots with the term man, human, with both words standing for 'the one who thinks', 'who remembers'. It is a question of "capabilities of the organized conscious or unconscious mental process .. that results in reasoning, thinking, (and) perceiving" (Webster Dictionary). It is a question of human deliberation that accommodates itself to what it finds and is responsive to complexities of all kind. Nussbaum (1986, p. 301) calls this the flexible quality of human reasoning, which allows the appearances to govern themselves and to be normative for the correctness of human reasoning. But how can we capture this unified procedure or manner in teachers' thinking?

The Matter of the Practical

One way to deal with the problem is to consider teachers' thinking from the different knowledge perspectives. Kessels & Korthagen (1996) argue that the dominating conception of rationality in educational sciences has seen knowledge as *episteme* instead of knowledge as *phronesis* (cf. Jonsen & Toulmin, 1988; Nussbaum, 1986). Knowledge as episteme is usually connected to the scientific understanding of problems and, according to Kessels & Korthagen (1996, p. 18), it considers knowledge as propositional, general by its nature, and it is formulated in abstract terms. Knowledge is essentially conceptual.

When knowledge is viewed from the phronesis perspective it looks quite different. Kessels and Korthagen (1996, p. 19) stress that it is mainly concerned with the understanding of concrete cases and complex situations. It considers knowledge as variable, particular by its nature, and it is mainly formulated in concrete and context-related terms. Phronesis deals with particulars, and it is essentially perceptual instead of conceptual. This is a cru-

cial difference. In the case of phronesis, the ultimate appeal is to perception, not to theories, or any conceptual knowledge.

Phronesis deals with practical complexities and lived experiences. Aristotle views this practical capacity of human thought as essentially loose or indefinite by nature. He argues that "every statement concerning matters of practice ought to be said in outline and not with precision ..." because "... statements should be demanded in a way appropriate to the matter at hand" (Aristotle, Nic. Eth., Book VI, 1103b-1104a). And in practice, the matter at hand in educational situations tends to be imprecise by nature.

Regarding the research on teachers' thinking from the perspective of phronesis, the basic question can be formulated as "what is perceived?" To be able to choose appropriate actions, teachers above all must be able to perceive and distinguish the relevant features. These cannot be transmitted in some general and abstract form because, as Nussbaum (1986, p. 303) emphasizes, it is a matter of fitting one's choice to the "complex requirements of a concrete situation", taking all of its contextual features into account.

However, as Kessels and Korthagen (1996) remind us, the perception we are now talking about is not just the normal sensory perception. Phronesis deals with more than meets the eye. It is the sort of eye that individuals develop simultaneously, both to look at and look beyond the events and objects at hand. Eisner (1991) speaks about *"The Enlightened Eye"* that is based on the qualitative thought of human understanding. It signifies that we are not seeking to reveal reality as it really is. Instead, we must be content with a mind-mediated version of it. This is because we are ultimately stuck with our judgements and interpretations, the vehicles for our meaning-making.

Nevertheless, the problem is that to others meanings are usually hidden or veiled. Therefore, what we need are descriptions and interpretations that are adequate enough to reveal structures and levels of experiential or textual meanings (van Manen, 1990, p. 181). As a result, if we succeed, we will get a description or interpretation that we can nod to, recognizing it as a kind of description or interpretation that helps us to understand the thoughts and experiences of others, as well as our own. Van Manen (1990, p. 27) speaks about a "phenomenological nod", which means that a good description or interpretation is collected by lived experience, and helps to recollect lived experience.

The standpoint of the knowledge as phronesis is the person. The knowledge is personal, practical and contextual. It is not a question of some general principle that is somehow related to the person, but instead, how the person is interrelated with the knowledge itself. As Nussbaum (1986, p. 311) puts it:

> "It is not just heuristic towards a value that would be valuable without this person and his choices; it is definitive of value, and this value would not be value but for its relation to this human person".

Alas, in case of teachers' thinking, the central question is, what do teachers perceive? Where are teachers' thoughtful minds set?

Sketching upon Teachers' Mind Set

To be able to outline this wider, perception-based type of knowledge in teachers thinking, we do not primarily need ready-made theories nor tightly defined and solid concepts. What we need is the knowledge and understanding of the concrete situations teachers perceive, the experiences they have, the plans teachers intend to execute, and how they reflect upon the consequences. Kessels & Korthagen (1996, p. 21) argue that without such a perceptional standpoint, hardly no knowledge of practical relevance, in the sense of phronesis, is formed.

Mind set can be see as a useful conceptual tool for examining how teachers look at the events and problems that concern them in their practical affairs. It aims at better knowing about differing patterns of perceiving and reasoning. In practice, mind set helps us to conceive the way teachers define and understand issues they deal with within their profession. Mind set can be used both conceptually and methodologically in two complementary ways.

First, the narrower concept of the term refers to a quite stable mental attitude towards perceiving objects or events. It answers the question: what is perceived? What is the content in teachers' thinking? It means simplifying the object or event perceived to a personal frame of reference in order to understand it (Fisher, 1992, p. 23). This object or incident can be regarded as a focal event that teachers treat selectively in their thinking. The question then becomes: what do teachers treat as focal? And, what can be

regarded as a contextual background in which this focal event is embedded?

Second, the broader concept of the term refers to an integrative and interrelated context in teachers' thinking. It answers the question: how things are perceived and thought about? What kind of design for perceiving and reasoning can possibly be outlined to describe teachers' thinking? In this sense, teachers' minds are sketched upon by some kind of framework of mental constructs (e.g. beliefs, images, assumptions, and habits of reasoning) in their cultural contexts by which teachers' professional knowledge is sorted out and given meaning. In this sense mind set examines how the demands of a surrounding culture affect those who must operate within it. It concentrates on how individual teachers construct their "realities" and meanings that adapt them to the school systems.

When mind set is viewed from the phronesis perspective, we need to define teachers' thinking much in terms of teachers' personal experiences and their reported doings and its results. The perspective presupposes, as already Dewey (1929) has noted, that we should avoid the assumption that what knowledge must be had to be known in advance. Mindful orientation cannot rule out processes relating to personal meaning making. It cannot and does not rule out subjectivity and its role in all educational decision-making. Actually, it is much concerned with *inter*subjectivity—how teachers come to know other's minds. Mindful orientation in teachers' thinking views thoughts, words, and actions as processes and products of social interaction. "Thought entities" are actually out *in the social world* of action and interaction.

An important issue to be addressed in the conceptualization of teachers' pedagogical mind set is that how contexts in which these minds are situated and from which they spring help to shape their meaning and weight their value. One's teaching, what one knows about teaching, and what one believes is possible and desirable in one's teaching all vary according to the context in which the teaching is done. The context that influences teacher's pedagogical mind set in particular ways might be the subject department of which the teacher is a member, the district in which he or she works, the isolated or collaborative nature of the professional relationships among the teacher's immmediate school colleagues, and so on.

Consequently, the purpose of mind set is to explore more general ways in which minds in their cultural contexts are thought about, and the pedagogical practices that seem to follow from these ways of thinking.

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The Way Thinking Is Once Again[1]

Pertti Kansanen

An older colleague of mine has claimed that researchers change the subject of their study too easily and too often. According to him, it would be more useful to stick to the same theme a little longer so that the development in the area would become visible. In that way the understanding of the phenomenon would be better, too. There may be something in this; it has been interesting to see how research on the teacher's thinking has developed and changed over some 20 years. In the early 1970's research on this theme was at its beginning. Now research on the teacher's thinking is a fad and one of the most common themes in the psychology of education. How has our understanding of this problem area developed?

Yesterdays

Clark and Peterson (1986) state in their well-known article that the theme of the teacher's thinking did not appear in the former handbook at all. A little more than ten years later there was already a large number of writings so that a summary was urgently needed. This is a good example of how motives and themes of research vary with the main research paradigm. The explanation in this case is not that the teachers started their thinking only in the early 1970's or that researchers had not been interested in this theme before. Of course, it is only a question of how to say it and what kind of terminology is in use. The focus of the theme, however, is different and the questions to be asked may differ quite a lot.

One important change has been that the process of the teacher's thinking is no longer related to learning or to the results of teaching. Thinking itself with its various forms and characteristics has been given the main role. The background has been, as before, the psychological properties of the thinking process; its classification and schemes have been central. Although content has been emphasised more and more, the pedagogi-

[1] First published in Hasselgren, B., Carlgren, I., Jonsson, M., & Lindblad, S. (1995). *Lära till lärare.* Stockholm: HLSFörlag.

cal side of the phenomenon has not assumed the most important place. The cognitive conception of the instructional process has been stressed and research on learning from this point of view has been important. The pedagogical content with its affective aims and goals has not been as common a research theme as the cognitive side of the problem. One old motive has, however, been popular the entire time: the planning of teaching.

When planning the instructional process, thinking cannot be avoided. And what is more important, thinking has pedagogical content and is focused on the essential point. It is also quite easy to include this in the problem of the study. Teachers can write their plans on paper and the researcher thus has material to analyse, or teachers can plan aloud and tape when planning and the researcher can transcribe the material. It is easy to add interviews in various forms with videotapes and stimulated recall, etc.; only the lack of imagination builds the limits of the empirical material. From this starting point it is possible for the researcher to describe and interpret his material and build syntheses and models according to his approach, be it inductive or deductive.

It is considerably more difficult to try to find out how teachers think during the instructional process. Thinking cannot be observed directly and asking is almost the only possibility for getting to know something about it. With stimulated recall it is possible to ask about the teacher's implicit or subjective theories. Usually, however, it is too demanding to use the concept of theory in these circumstances as Bromme (1992, p. 125), for example, has pointed out. It is also usual to refer to Polanyi's tacit knowledge and to the conception of reflection as used by Schön. Quite often teacher thinking is conceived rather universally without linking it to its very content of teaching and the properties of the instructional process.

What does it mean to act in the instructional process? It is not a wholly subjective phenomenon; the teacher and the students have certain limits and responsibilities in their actions. They must work according to the curriculum towards certain aims, goals, and objectives. Thinking in this context is not totally free. Besides the cognitive aspects, the normative characteristics become important. The emotional and the affective side brings feelings into the process. Because the whole process aims at certain aims and goals, there must be certain normative assumptions behind the decisions. That is why the instructional process is very complicated and too difficult, perhaps, to be studied as a whole. But what I try to emphasise is

looking at teacher thinking from the pedagogical point of view where we must take the pedagogical model or theories into consideration and try to find out what kind of pedagogical thinking teachers use when making different kinds of decisions in the middle of the instructional process or when planning this same process. It is always the pedagogical context as a whole that is important, not only some part or some parts of it, which can never be taken away from this totality (cf. Kansanen, 1993).

In the DPA Helsinki research project (Komulainen, Kansanen, Karma, Martikainen & Uusikylä, 1981), one of the main questions was to find out how teachers used the official curriculum in planning their lessons. The idea behind this question was to determine whether teachers were using the aims and goals of the official curriculum in their planning. Referring to the aims and goals was thought to be intentional or purposive, which is conceptually more advanced. Purposiveness is a more exact concept than intentionality. While the latter may refer to intentions in general, the former is meant to refer only to the aims, goals, and objectives in the instructional process. If the teacher has internalised the aims and goals presented in the curriculum, his/her behaviour is purposive. The teacher may have many kinds of intentions but only those that are of pedagogical content according to the curriculum are purposes in this context. In this way there is a difference between intentions and purposes by definition (Kansanen, 1993).

In the DPA Helsinki research paradigm, the instructional process is divided into three phases: the preinteractive phase, the interactive phase, and the postinteractive phase. These phases are known by the expressions planning, interaction, and evaluation. Philip W. Jackson's (1962) notion of the importance of the teacher's activities performed before the instructional process proper led our attention to the phase that he called "preactive teaching". We preferred to call it "preinteraction" with the emphasis on interaction instead of using Jackson's "preaction". At the same time, the role of the pupils was taken into consideration by dividing the interactive phase into the joint planning, the interaction proper, and the joint evaluation. In this way we tried to get more purposiveness into the instructional process.

One of the most common hypotheses of planning activities has been the so-called *Tyler rationale*. According to this model, planning is started with objectives, after which come the selection of content, organisation of teaching activities and evaluation. The phases are supposed to appear in this specific order. In particular, the position of educational objectives has

been problematic. Research results have shown continually that teachers do not plan according to this model. *Tyler rationale* is, however, a model of rational thinking. It is not reasonable to claim that teachers' thinking is not rational; the explanation must be somewhere else. I have suggested that in planning lessons this cycle is not functioning as a whole. The lessons are already a part of a larger totality where the curriculum and the educational goals and aims have been taken into account. It is not necessary for the teachers to think about and analyse these components every time they plan a new lesson. Instead of this first phase, the activities are concrete occasions every time. So the teachers start where they think they always need a new plan. Usually the content is new; it varies from lesson to lesson, and the activities of the pupils depend on actual situations and daily circumstances. Aims and goals may be quite permanent for a longer period or they have been thought about and analysed beforehand and seem to be clear. Evaluation comes afterwards, and that is why it is not needed during every lesson. This suggestion of mine has not been verified yet but in some interviews it has proved to be quite probable.

The six teachers participating in the DPA Helsinki study were extensively interviewed, especially about their working habits during the preinteractive phase concerning the role of the curriculum and the educational objectives in their planning. The main results are in Table 1.

Table 1. A summary of the teacher's activities during the preinteractive phase of the teaching process (Kansanen, 1981)

Teacher	A	B	C	D	E	F
Long-term planning	+	–	+	(+)	–	+
Short-term planning	+	(+)	+	(+)	(+)	+
Form of the plan						
mental outline	+	+	+	+	+	+
following the textbook	+	+	+	(+)	+	+
written outline	+	–	(+)	–	–	+
written outline in detail	(+)	–	–	–	–	–
Facilities in planning						
nationwide curriculum	+	–	(+)	–	–	+
local curriculum	+	–	+	–	–	+
textbook	+	+	+	+	+	+
teacher's guide for the textbook	+	+	+	+	+	+
colleagues	–	–	(+)	–	–	–
background materials	(+)	(+)	(+)	(+)	(+)	+
Content of the plan						
forms of activities	+	+	+	+	+	+
AV material	+	(+)	(+)	–	(+)	+
Homework	(+)	–	–	–	–	–
Evaluation	(+)	–	+	–	–	+

\+ = activity present regularly or quite regularly
(+) = activity present sometimes
– = no activity present

One of the most obvious findings was that the teachers did not think on the basis of the objectives. None of them ever mentioned the objectives as guidelines in their thinking. It was speculated that one explanation was that all these teachers had got their teacher education when aims, goals, and objectives were not emphasised in the teacher education courses. Is the situation different now, as teacher education has changed and teachers quite often make their curriculum themselves?

What's new?

It was interesting to see twenty years after the reform of the Finnish teacher education, with two new curricula in the comprehensive school in between, if planning practices had changed. The significance of aims and goals had grown considerably, and their role in the teacher education courses has been central. It was to be expected that when planning their lessons teachers would take this kind of purposiveness into consideration more than before. The other alternative would show the everyday practice to be so strong that the experiences during teaching would have higher priority than the theoretical models.

In her master's thesis, Marja Hytönen (1994) asked ten teachers, five males and five females, to think aloud when planning. All except one had the same theme (the American Civil War) and the plan was meant for the sixth grade. The recordings of the teachers' lesson plans were transcribed, and a semistructured interview was made on the basis of these plans. During the interviews the teachers could listen to their own planning, and they could read the lesson plans at the same time. The interviews were also audiotaped and written out. The teachers were quite experienced classroom teachers. As a part of her results, Hytönen constructed the same kind of table as I had used earlier (Table 2).

Table 2. A summary of the teacher's activities during the preinteractive phase of the teaching process (Hytönen, 1994)

Teacher	A	B	C	D	E	F	G	H	I	J
Period of planning										
Long-term planning (a year)	+	–	–	–	–	–	–	–	–	–
(some weeks)	+	–	+	+	–	–	+	–	–	–
Short-term planning (a week)	+	–	–	–	–	–	–	–	–	–
(a lesson)	+	+	+	+	+	+	+	+	+	+
Form of the plan										
mental outline	+	+	+	+	+	+	+	+	+	+
following the textbook	+	+	+	+	+	+	+	+	+	+
written outline	+	–	+	–	–	–	–	–	–	–
written outline in detail	+	–	–	–	–	–	–	–	–	–
Facilities in planning										
nationwide curriculum	–	–	–	–	–	–	–	–	–	–
local curriculum	+	–	–	–	–	–	–	–	–	–
textbook	+	+	+	+	–	+	–	+	+	+
teacher's guide for the textbook	+	–	–	–	+	+	+	–	–	+
colleagues	+	–	–	–	–	–	–	–	–	–
background materials	+	–	+	+	+	+	–	+	–	–
Content of the plan										
aims and goals	+	–	–	–	–	–	–	–	–	–
content of teaching	+	+	+	+	+	+	+	+	+	+
forms of activities	+	–	+	+	–	+	–	–	+	–
AV material	–	–	–	–	+	+	–	–	–	–
homework	+	+	+	+	+	+	–	+	+	+
evaluation	+	–	–	–	–	–	–	+	–	–
integration	+	–	+	–	–	+	–	–	–	–
time	–	+	+	–	–	–	–	+	–	–
Pupils										
feelings and needs	+	+	+	+	+	–	+	+	+	+
social interaction	+	–	+	–	–	–	+	+	–	+
Learning process	+	–	+	–	–	+	+	–	+	–

\+ = activity present regularly or quite regularly
– = no activity present

A quick comparison of the tables shows that the results are quite similar. It seems that teachers seldom make long-term plans but practically all the teachers plan regularly in some way. Usually they make a mental outline without written notes. They use textbooks as the basis of their planning and refer to teacher's guidebooks as well as to the background material. In addition, the content and the activities of the pupils are central to the teachers' thinking as are such things which belong to this totality (AV material and homework). Planning is quite concrete, as could be expected, because the teachers were asked to plan their daily work. It can be speculated that it is natural that they do not use theoretical concepts and do not speak about theoretical models or pedagogical theories. Perhaps the answers could be different if their task to think aloud were more clearly focused on those things. In any case it seems clear that teachers use different kinds of language and use different terms in describing their everyday work compared with researchers and theoreticians.

Generally the results were quite similar to the summaries presented by Clark and Peterson (1986, p. 261, p. 264). Teachers do not use aims and goals as a starting point in their planning, and in analysing their contemplation it seems quite clear that they do not use the curriculum in their planning. A practical solution is the textbooks and teachers' guides to these books. If their teaching behaviour is purposive at some level, it does not become visible as they describe their planning practices.

With these results in mind, it was interesting to note some particular details in Kyösti Parviainen's study (1994) made according to a procedure similar to Hytönen's study. In his master's thesis, he, too, asked two female teachers to think aloud when planning. Both of the teachers planned four or five lessons and audiotaped them themselves. The taped lessons plans were transcribed and a semistructured interview was made on the basis of these plans. During the interviews, the teachers could listen to their own planning, and they could also read the lesson plans at the same time. The interviews were audiotaped and written out, too, as was also done by Hytönen. The teachers were classteachers with only some years' experience of teaching. One had been a teacher for three years; the other had seven years' teaching experience but she was working for the certificate of formal competence.

Generally, the results were similar to those described earlier. The two teachers did not mention aims and goals when planning, with one excep-

tion. In the Finnish teacher education system, the students can specialise in two subjects, with their pedagogical content knowledge being more extensive than in other subjects. When the teachers described their planning in these subjects, both of them mentioned objectives, which they clearly kept in mind at all times. It may be that teachers must concentrate on the facts and content when their content knowledge is not satisfactory. Perhaps good content knowledge creates self-confidence and freedom in thinking and thus independence and autonomy.

I'm beginning to see the light

It seems that in spite of the increasing emphasis on aims and goals in the teacher education courses and in the pedagogical discussion in general, these concepts do not come out in the teachers' reports when they describe their planning practices. This contrast in language between teachers and researchers has remained unexplained although many hypotheses have been presented. Clark and Peterson (1986, pp. 265–266) refer to two studies where this problem has arisen. One group of experienced teachers said that aims and goals as guidelines in their planning were implicitly present all the time without particular attention to them but student teachers used the *Tyler rationale* because it was required by the supervisors. In every case, the *Tyler rationale* was known to the teachers but they did not use it in their planning. In another study reported by Clark and Peterson, the teachers decided on objectives mostly during the interactive phase and during the preinteractive phase after planning but before the lesson.

Studies that concentrate on planning are in a certain way artificial and they take only one part of the totality into closer consideration. It may be that the teachers describe their activities in this particular context, too, and that they do not pay attention to the totality although it is, of course, always in the background.

I have assumed earlier that the *Tyler rationale* is not used for shorter periods and with daily lessons because the teachers have already gone through the aims and goals and got acquainted with the curriculum when doing their long-term planning. The daily planning is a natural part of this sequence, and aims and goals are not needed with every short plan. The conditions of purposiveness, however, require good knowledge of the national and local curriculum. Research has frequently shown that teachers do

not use the curriculum as a guide and that they have an insufficient knowledge of it. The role of textbooks has been central, and the aims and goals of the curriculum come out through them. In this way, textbooks take a position as the practical curriculum, and it is not necessary to use the fundamental curriculum any more. In this situation the question is if this kind of teaching behaviour is intentional in the sense of purposiveness. Purposiveness requires good knowledge of the curriculum and especially good knowledge of the aims and goals in the curriculum, acceptance of these aims and goals and, in the end, internalising these into the teacher's own thinking. It is certain that this kind of purposiveness does not come out in the interviews and planning reports focusing on the planning of the daily lessons.

The place of aims and goals in teachers' thinking is of special interest in these days when the schools and the teachers are participating more and more in the making of their own curricula. The idea behind this procedure is to get the teachers more involved in their work. Through this process it is expected that they will acquire better knowledge of the curriculum in general and that the curriculum will gradually get its intended place in directing school life. It is supposed that teacher's work becomes more autonomous but at the same time he/she becomes more committed to the decisions made in the writing of the curriculum. However, I want to point to the paradoxical situation where we are now. Reading and writing a curriculum of their own has always been possible for teachers; there is nothing new in this process. Now the teachers must participate in making their own curriculum. Does anyone believe that man will have more motivation to do something when compelled compared with the situation when it was free?

Planning is looking at the future. As I read a number of lesson plans for this article, for the first time I began to wonder why the teachers described their planning as they did. The teachers reported what they intended to tell the pupils. There was order in these accounts: they were full of details, there were questions concerning the content, they were pondered alternatives presenting different points of view of the content. In short, the lesson plans were full of content with some suggestions for pupil activities in connection with this content. My question is: Why do teachers tell so much about content if they have a good knowledge of it? If they have a good knowledge of the content, I would expect them to tell how to use this knowledge in the pedagogical context without telling things they already

know. Why not outline this content in some system, time, order, hierarchy, *Tyler rationale*, etc.? Or is it that they do not have a good knowledge of the content of the lessons and that is why they must study the content by telling it in their plans? One cue for this direction was Parviainen's finding that for those subjects in which the teachers were specialised they used aims and goals in their reports. Or is this kind of result only an artefact that depends on the research technique, and the teachers do not know exactly what the researcher wants from them? The fact, in any case, is that the lesson plans do not have any other outline as how the content is going on. Where are the justifications, alternatives with various strategies, aims and goals, etc.? Or are these things so simple and self-evident that experienced teachers will not mention them to the researchers?

To the teacher, the relation between thinking and action has many points of view and quite probably a certain hierarchy. It may be that the empirical studies touch only the surface, and it is only a misunderstanding that the researcher has in his own thinking when expecting certain words and concepts. Although the teachers may have the central aspects of purposiveness at the back of their minds they may not speak of them. Many teachers have told me when asked about aims and goals in the curriculum that these are only theoretical nonsense and curricular poems. In spite of this, those teachers have shown very purposive behaviour on the concrete level. Bromme (1992, pp. 133–136) uses the word "Denkstil", which means a particular way of thinking that is socially accepted and shared by the participants. Research on this theme and on its related concepts (Leherethos, belief systems, personal practical knowledge, implicit theories, tacit knowledge, etc.) is only at its beginning. Grossman and Stodolsky refer to some studies where there has been "... a great deal of congruence between teachers' reported beliefs about the purposes for teaching a subject and their classroom instruction ..." (1994, p. 205). Teachers live and work in a social context where the curriculum is a logical and congruous as well as self-evident part of the totality so that there is, perhaps, no need to raise the foundations of this context into conscious contemplation.

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Preparing Prospective Elementary Teachers to Teach Mathematics: a Problem-Solving Approach

Frank K. Lester, Jr. & Diana V. Lambdin

In the past decade or so, numerous influential documents have voiced a strong call for reform in American mathematics education and for developing mathematical literacy and mathematical power in all students (National Council of Teacher of Mathematics [NCTM] Curriculum and Evaluation Standards for School Mathematics, 1989; NCTM Professional Standards for Teaching Mathematics, 1991; National Research Council [NRC] Everybody Counts, 1989). These documents stress that students should be actively engaged in solving non-routine problems; in exploring, testing, and making conjectures about mathematical ideas; and in being responsible for their own learning. Of course, because teachers are key figures in the change process, we cannot hope to change the way mathematics is taught and assessed unless we also adopt a new vision of teacher education. In this paper we describe a mathematics course for prospective elementary teachers that was developed at Indiana University (IU) to answer the call for new ways of teaching and studying mathematics.[2]

A Brief History of IU Mathematics Education Innovation

Thirty years ago mathematics teacher education at Indiana University began a new, innovative phase in its long and distinguished history when Professor John LeBlanc joined the faculty in the School of Education. He was particularly interested in the need for university mathematics educators to think much more deeply about mathematics teacher education for prospective elementary teachers (PSTs). Due to his far-sightedness and diligence, he soon became one of the foremost American innovators in primary mathematics teacher education. In particular, his "Mathematics Methods Program" (MMP), which was begun in 1971 under the sponsorship of the

[2] In the United States, grades kindergarten through 6 (children of ages 5–12) typically are referred to as "elementary school" and teachers of these grades are considered elementary teachers.

National Science Foundation, established a way of thinking about the mathematical and pedagogical preparation of elementary teachers that has endured at Indiana University to this day. The MMP focused on the development of instructional materials and a teaching philosophy that involved the integration of mathematics content, pedagogy, and school-based practica in the university preparation of future elementary teachers. Moreover, by bringing bright and creative young mathematics educators to Indiana University to work on the development and pilot testing of MMP materials, LeBlanc was responsible for helping to launch the careers of a number of mathematics educators who are now quite prominent in the USA, and indeed, around the world. (Leaders such as Thomas Carpenter, John Dossey, Kathleen Hart, Glenda Lappan, Richard Lesh, Thomas Schroeder, Carol Thornton, and Paul Trafton come readily to mind.) At one time, the materials developed by the MMP staff were being used at more than 40 universities throughout the United States, Canada, and Australia.

In 1988, LeBlanc, Frank Lester, Diana Lambdin, and others at Indiana University began work on a new kind of teacher preparation project, again under the sponsorship of the National Science Foundation. This project, Preparing Elementary Teachers to Teach Mathematics (PETTM) had two themes at its core: (1) the entire mathematics and pedagogical preparation of elementary teachers should be built upon the notion that problem solving is the focus of school mathematics, and (2) experienced, practicing elementary teachers should play a much more prominent role in the professional preparation of future teachers. This project, like the earlier MMP, has had a significant influence on the mathematics education of prospective teachers in the United States.

In this paper we first discuss the basic notions underlying these two projects and we then describe the more recent of these projects in some detail. This description focuses on the mathematics preparation we consider essential for elementary school teachers to be able to provide effective instruction for children.

Our Basic Philosophy Regarding Problem-Solving Instruction in Mathematics

For students who are struggling to become better problem solvers the difficulty caused by the complexity of problem solving is compounded by the fact that most of them do not receive adequate instruction, either in quality or quantity. Unfortunately, there are no fool-proof, easily-implemented methods of helping students to improve their problem-solving ability. But, we have found it useful to distinguish among three approaches to problem-solving instruction: (a) teaching *about* problem solving, (b) teaching *for* problem solving, and (c) teaching *via* problem solving. An explicit statement of this distinction was contained in a paper written nearly 20 years ago by Larry Hatfield (1978). Schroeder and Lester (1989) elaborated on these three approaches in an article in a yearbook of the National Council of Teachers of Mathematics (NCTM).

Teaching *About* Problem Solving

The teacher who teaches *about* problem solving highlights George Polya's model of problem solving (or some minor variation of it). Briefly, Polya's model describes a set of four interdependent phases that are involved in the process of solving mathematics problems: understanding the problem, devising a plan, carrying out the plan, and looking back (Polya, 1973). Students are explicitly taught the phases, which according to Polya, expert problem solvers use when solving mathematics problems, and they are encouraged to become aware of their own progression through these phases when they themselves solve problems. Additionally, they are taught a number of "heuristics" or "strategies" from which they can choose and which they should use in devising and carrying out their problem-solving plans. Some of the several strategies typically taught include: looking for patterns, solving a simpler problem, and working backwards. At its best, teaching *about* problem solving also includes experiences actually solving problems, but it always involves a great deal of explicit discussion of and explicit teaching about how problems are solved.

Teaching *For* Problem Solving

In teaching *for* problem solving the focus is on ways in which the mathematics being taught can be applied in the solution of both routine and non-

routine problems. Although acquiring mathematical knowledge is of primary importance, the teacher interested in teaching *for* problem solving thinks the essential reason for learning mathematics is to be able to use it to solve problems. Consequently, students are given many instances of mathematical concepts and structures and many opportunities to apply mathematics in solving problems. Further, the teacher who teaches *for* problem solving is very concerned about students' ability to transfer what they have learned from one problem context to others. A strong adherent of this approach would suggest that the sole reason for learning mathematics is to be able to use the knowledge gained to solve problems.

Teaching *Via* Problem Solving

In teaching *via* problem solving, problems are valued not only as a purpose for learning mathematics, but also as a primary means for doing so. The teaching of a mathematical topic begins with a problem situation that embodies key aspects of the topic, and mathematical techniques are developed as reasonable responses to reasonable problems. A goal of learning mathematics is to move certain types of problems from non-routine status to routine status. The learning of mathematics in this way may be viewed as a development from the concrete (a "real world" problem which serves as an instance of the mathematical concept or technique) to the abstract (a symbolic representation of a class of problems, and techniques for operating with those symbols).

Some Observations about the Three Approaches

Although these three conceptions of teaching problem solving in mathematics can be isolated in theory, in practice they overlap and occur in various combinations and sequences. Thus, it is probably counter-productive to argue in favor of one or more of these types of teaching or against others. Nevertheless, if an instructor intends to make problem solving the "focus of instruction," he or she needs to be aware of the limitations inherent in exclusive adherence to either of the first two types of problem-solving instruction. One such limitation stems from the fact that problem solving is not a mathematics topic and it should not be regarded as such. If teaching *about* problem solving is the focus, there is a danger that "problem solving" will be regarded as a strand to be added to the curriculum. Instead of problem solving serving as a context within which mathematics is learned and

applied, it may become just another topic taught in isolation from the content and relationships of mathematics.

A different kind of shortcoming can arise from teaching *for* problem solving. When this approach is interpreted narrowly, problem solving is viewed as an activity students engage in only after the introduction of a new concept or following work on a computational skill or algorithm. The purpose of this approach is to give students an opportunity to "apply" the concepts and skills recently learned to the solution of "real world" problems. In the elementary schoo., these problems often appear under a heading such as "Using Division to Solve Problems" and a solution of a sample story problem is provided as a model for solving other, very similar, problems. More often than not, solutions to these problems can be obtained by simply following the pattern established in the sample but when students encounter problems that do not follow the sample they often feel at a loss. It has been our experience (which is supported by several studies) that students taught in this way often simply pick out the numbers in each story and apply the given operation(s) to those numbers without regard for the problem's context and, as often as not, they obtain the correct answers. Simply put, we do not regard this sort of activity as problem solving. Indeed, it may not even involve mathematical thinking. Furthermore, a side effect is that students may come to believe that all mathematics problems can be solved quickly and relatively effortlessly, and without any need to understand how the mathematics they are using relates to real situations. Unfortunately, this approach to problem-solving instruction has been quite common in textbooks at all levels—elementary through university.

Unlike the other two approaches, teaching *via* problem solving is a conception that has not been adopted either implicitly or explicitly by many teachers, but it is an approach to the teaching of mathematics that deserves to be considered, tried out, and evaluated. Indeed, teaching *via* problem solving is the approach that is most consistent with the recommendation of the NCTM's *Curriculum and Evaluation Standards for School Mathematics* that: (a) mathematics concepts and skills be learned in the context of solving problems; (b) the development of higher level thinking processes be fostered through problem-solving experiences; and (c) mathematics instruction take place in an inquiry-oriented, problem-solving atmosphere (NCTM, 1989).

The point of the foregoing discussion is that progress has been slowed tremendously because there has been no commonly accepted view of what it means to teach with a problem-solving perspective. This lack of consensus has hampered researchers as well as curriculum developers and teachers.

As might be expected from this discussion of the three approaches to problem-solving instruction, at Indiana University we have adopted teaching via problem solving as the basic approach for teaching our PSTs. We now turn our attention to a description of the second of the two programs—MMP and PETTM—mentioned in the Prologue of this paper.

Preparing elementary teachers to teach mathematics: 1988–1998

The MMP operated successfully at Indiana University from 1971 through 1980—being altered in form and focus from time to time over these years. In 1988, John LeBlanc undertook a new project with an essentially new cast of colleagues (the only holdover from the MMP days was Frank Lester). Although this new project involved both pre-service and in-service components, in this paper we describe only the main features of the pre-service component.

Helping Elementary Teachers Learn Mathematics Via Problem Solving

From its initial conception, the primary goal for the new course we intended to develop was to provide rich, rigorous mathematical experiences for PSTs with problem solving and exploration at their core. To state that problem solving was to be at the core of the course was an ambitious claim. In developing the course we did not set out simply to identify clever and interesting problems to sprinkle liberally among topics. Instead, we wanted to make problem solving the *raison d'etre* of every activity. Although some existing textbooks on mathematics for elementary teachers have made a serious attempt to make problem solving a focus in the treatment of topics, all of them fall far short of the mark. Thus, we suspected from the outset that the development of the sort of course we were envisioning would not be an easy task to accomplish. Our suspicions were well founded: the task proved

to be even more difficult than we had imagined. Three factors served to make our efforts especially challenging:

1. It is very difficult to expose PSTs to all the mathematical ideas we view as important in a 15-week long course which emphasizes problem solving in small cooperative groups;
2. Many (in some classes, most) PSTs were actively opposed to the spirit of the course in the beginning (they simply were not used to being asked to think about mathematical ideas);
3. The course was taught by graduate students who often were neither sensitive to the professional needs of elementary teachers, nor intellectually and emotionally prepared to "teach" mathematics via problem solving.

Notwithstanding these obstacles, the course was developed and we think it is deserving of its official title: *Mathematics for Elementary Teachers Via Problem Solving*. The new course has had four main goals since its inception:

1. To help students develop adult-level perspective and insights into the nature of mathematics taught in the elementary school;
2. To improve students' ability to engage in mathematical thinking and reasoning;
3. To increase students' ability to use their mathematical knowledge to solve problems; and
4. To expose students to learning mathematics via problem solving.

History of the Development of the Course

The following short history describes the extent of the effort involved in developing such an ambitious course. This chronicle also documents the potential for smooth interface between the process of curriculum development and the process of conducting research related to that development (cf., Gravemeijer, 1994). Moreover, this overview may be helpful to others who may be contemplating the development of similar courses.

During the Fall Semester of 1988 (late-August—December), a group of faculty and graduate students was formed to plan for and design mathematics laboratory activities for the new course. From January until May 1989 the group tried out many of the proposed activities with groups of undergraduate volunteers. Reception of the laboratory-based lessons by these

students was favorable, but it was clear that substantial revision was needed of most of the activities and that some of the activities probably were not suitable for our purposes. Summer 1989 work involved modifying and refining the activities already designed, designing additional activities, and collecting and modifying information to be included in the student and teacher materials.

In the Fall Semester of 1989, the 250 articles and activities collected during the summer were sorted and sets of activities were developed on the following content areas: numeration, operations, geometry, measurement, number theory, and rational numbers. Preliminary teacher's notes were also developed to accompany the activities. Some of the number theory and rational numbers activities were tried out in an existing course for PSTs. Videotapes were developed showing PSTs working in small groups on problems of the sort that are included in the course.

During the Spring Semester 1990 (January — early-May), there were two pilot sections of the course, each section having about 25 students. During this semester, a trial of a complete set of the instructional materials was initiated. As they used the materials throughout the semester, the two instructors kept extensive notes with respect to such factors as: level of difficulty for students; adequacy of the directions, explanations, etc.; appropriateness for use in a laboratory setting; and student satisfaction. In addition, videotapes were made of "experts" modeling problem solving in front of the classes. Assessment practices that were aligned with the curriculum were developed during this semester, including problems used in group testing situations. Reflective writing assignments and out-of-class projects were other tasks worked on during this semester.

Substantial revisions were made during the summer months and an "abbreviated" set of teachers' notes was prepared in anticipation of offering five sections (about 150 students total) of the new course during the Fall Semester 1990. Four orientation sessions were held during Summer 1990 to acquaint the Fall instructors with the philosophy and overall nature of the course. Not only were the revised instructional materials put to the test during the Fall Semester, but also the abbreviated teachers' notes were used for the first time. All of the five sections were taught by teachers who had not taught the course previously, nor had they been involved in the development of any of the activities. However, an experienced teacher of early versions of the course, who had also helped develop many of the activities,

was employed as the course coordinator. She was able to further orient the new instructors, provide feedback about the course, and aid in the development of tests. More out-of-class projects were developed during this semester.

By employing instructors who were completely new to the course, we hoped to be able to gauge the adequacy of the "Teacher's Guide" that had been developed for the instructors. Furthermore, each section of the course was visited by an experienced observer once a week for purposes of assessing the appropriateness and effectiveness of the revised instructional materials. Weekly debriefing sessions were held with the instructors in order to get their reactions to the notes and materials. The observations and debriefing sessions provided numerous ideas for further revisions, particularly of the teachers' notes. Videotaping of instructors and small groups of students working on activities took place in an effort to develop some videotapes to be used for new instructor orientation.

During the Spring Semester 1991 there were five new sections of the course (about 150 students with five instructors, two of whom were new). Additional, but minor, revisions of the instructional materials and the Teacher's Guide were completed and a bank of test problems was developed for use by the instructors. Two new sections were developed for the Teacher's Guide: a section including sample test items and a section including sample out-of-class projects. These sections explained the basic format of the tests and projects and provided guidance for developing tests and new out-of-class projects. One additional out-of-class project was developed bringing the total to 14. Videotaping of instructors and small groups of students continued throughout the semester. Post-unit meetings were held once again with the instructors to get their reactions to the teacher notes and student activities.

During the Summer of 1991 final revisions of all materials took place. In addition, introductory sections were developed for both the teacher and the student materials. For the teacher materials, this section contains information about such topics as the goals and philosophy of the course, the role of problem solving, the teacher's and students' roles in the course, cooperative learning, assessment, engaging the students in reflection, the teacher's guide, and the need for and use of a supplemental textbook. The introductory section in the student materials has the following information about the course: purpose and organization of a student note-

book, information about assessment and grading, information about cooperative work, course schedule, schedule for use of materials, homework schedule, problem-solving tips, and notebook grading forms. Finally, a narrated videotape appropriate for orienting new instructors to the course was developed. This tape shows excerpts from actual classes of teachers "introducing an activity," "commenting to small groups while they work," "leading class discussions," and "wrapping up after small-group work." The video tapes of an expert modeling problem-solving behavior and of small groups solving a problem from the course materials are used in the classroom to allow the students to observe other persons solving problems. A discussion follows the viewing of each videotape, focusing on the ways the person(s) on the tape tried to understand the problem, make and implement a plan, and evaluate the solution.

Important Ingredients of the Course

Five features characterize the course: (1) "big mathematical ideas" serve as important organizers for the course; (2) cooperative learning is an essential part of regular instruction; (3) reflective writing and concept maps are useful tools to help students make strong connections among the mathematical ideas they encounter and consolidate their mathematical understanding; (4) assessment is a continuous activity engaged in by both the teacher and students to the extent that it becomes seamless with instruction; and (5) the new view of instruction requires that both the teacher and students assume different roles in daily classroom activities.

Big ideas in mathematics for preservice elementary teachers. The term "big idea" refers to those themes that pervade several areas of mathematics and which serve to make connections among mathematics topics. These big ideas, then, are recurring, unifying themes in mathematics. With respect to identifying KEY big ideas to emphasize in a course or courses for PSTs, we determined that it does not matter a great deal which ones are chosen. Instead, what matters is that to be a big idea an idea should:

1. Help PSTs make connections among what may for them seem like unrelated topics;
2. Help PSTs make connections between the world of mathematics and the "real world," and

3. Provide ample opportunities for PSTs to "meet the Queen" (i.e., come to have a greater appreciation for and understanding of the beauty and subtlety of mathematics and mathematical activity).

Notwithstanding our belief that it is not so important to be concerned about selecting a specific set of themes, we thought it would be useful to take a look at what others think the big ideas are. In particular, we found the views of Davis and Hersh (in *The Mathematical Experience*, 1981), Steen and others (in *On the Shoulders of Giants*, 1990), and the authors of the 24th yearbook of the NCTM (in *The Growth of Mathematical Ideas: Grades K - 12*, 1959) to be especially helpful.

The Mathematical Experience (Davis & Hersh, 1981). The authors identify both inner and outer issues related to doing and studying mathematics. Their inner issues seem to be closest our notion of big ideas. They are as follows: abstraction, aesthetics, algorithmic vs. dialectic mathematics, formalization, generalization, infinity, math objects & structures, pattern, order & chaos, proof, symbolism, and unification.

On the Shoulders of Giants (Steen, 1990). The authors of this treatise on the nature of contemporary mathematics discuss two types of ideas: connective themes and deep ideas (that nourish the branches of mathematics). Both types seem to be related to our view of big ideas. Their connective themes include: algorithms, classification, exploration, inference, measurement, symmetry, and visualization. Among their deep ideas are the notions of: mathematical structures, attributes, actions, abstractions, attitudes, behaviors, and dichotomies.

The Growth of Mathematical Ideas: Grades K - 12 (NCTM, 1959). The authors of the 24th yearbook of the NCTM insisted that "teachers plan so that pupils continually have recurring but varied contacts with the fundamental ideas and processes of mathematics" (p. 2). Their list of big ideas includes the following: language and symbolism, mathematical modes of thought, measurement and approximation, number and operation, probability, proof, relations and functions, and statistics.

Some thoughts about big ideas. Of course, each of the authors considered above used somewhat different terminology, but there was considerable agreement that the number of truly big ideas is relatively small. Moreover, it is interesting to note that traditional branches of mathematics (e. g., algebra, geometry, analysis) were not viewed by any of the authors as being big ideas in themselves and mathematical "actions" seemed to be as important as mathematical "structures."

Our own thinking, guided by a consideration of the ideas expressed in the three volumes mentioned above, has led to a conceptualization of the big ideas in terms of three dimensions: *structures*, *actions*, and *tactics*. Each dimension contains big ideas that exemplify a fundamental theme, process, or aim of mathematical activity.

Structures include mathematical ideas and objects that mathematicians and other "doers" of mathematics work with. This includes entities such as equivalence, function and relation, measurement, number and operation, shape and space, and pattern and order, among others. The structures identified here are almost arbitrary; many other (perhaps better) structures could have been chosen. This is consistent with the notion that the specific big ideas are not nearly as important for these courses as the idea that there are unifying themes that pervade many branches of mathematics.

The *actions* refer to the sorts of activities that individuals engage in when they are doing mathematics and, as often as not, they are the goals of mathematical activity (e.g., creating a generalization, developing a useful mathematical model). These actions help distinguish mathematical activity from other kinds of activity. Among the actions that seem to be particularly relevant for courses for PSTs are verifying, generalizing, modeling, representing, and composing/decomposing.

The *tactics* dimension includes those generic tools that aid the individual in doing mathematics. The four tactics we have chosen are conjecturing, creating and using algorithms, using problem-solving heuristics, and developing and using appropriate language and symbolism, but there are probably other equally as important tactics.

Finally, we reiterate the tentative, incomplete nature of these dimensions and the big ideas contained within them. Nevertheless, they provided a framework for course development. Some examples of big ideas within each of the three dimensions are given in the table 1 below.

Table 1. Dimensions of Big Ideas in Mathematics with Examples.

Structures	*Actions*	*Tactics*
Equivalence	Generalizing	Creating/using algorithms
Function/relation	Representing	Conjecturing
Measurement	(De)composing	Using heuristics
Number/operation	Verifying	Using
Shape & space	Modeling	language/symbolism

Cooperative learning. The philosophy of the course requires that students—rather than the teacher—must bear the primary burden for constructing mathematical arguments and for providing mathematical explanations. Shifting the burden of explanation in this way is accomplished by organizing each class in a very different way from the usual university mathematics class: During much of each class period students work cooperatively in small groups to wrestle with problems that challenge them, to develop new and deeper understandings of fundamental mathematical concepts, and to talk about their new ways of thinking.

On the first day of class the instructor must group students into cooperative groups of about four students each. Since most students will not yet know each other, initial groups are typically formed by merely suggesting that four students who are sitting near one another put their desks together for small-group work. Students are then expected to keep working each day with the same group of people until the teacher indicates that it is time for a change of groups (usually every 3 or 4 weeks).

When the time comes, some instructors find it best to form new groups totally at random. One way to do this is to put a pile of playing cards near the door and to instruct students to take a card as they arrive at class on the day when groups are to be changed. Then those four who have the same card number (for example, 7 or 2 or Queen), regardless of suit, form a group. (The instructor will have to take extra cards out of the deck ahead of time so that the appropriate number of groups of four cards remain—for example if there are 24 students in the class, an instructor might remove from the deck all cards except those from Ace through 6. This will leave 24 cards, six sets of four cards each.)

There may be times when random assignment to groups does not seem appropriate. For example, if there are one or two students in a class who have trouble working together, the instructor may want to assign

groups so that these students are separated. Or the instructor may want to arrange groups so that neither the best students (nor the weakest students) are concentrated in one group. Near the end of the semester, an instructor may choose to ask each student to turn in a list of individuals they would like to work with and may form groups deliberately to include students who have expressed an interest in working together.

The role of the instructor in class is quite different from in more traditional mathematics classes. Rather than preparing a lecture, the instructor is usually responsible for a three-part lesson: (a) providing a brief introduction to the day's activities, (b) circulating about the room while students work in small groups and making appropriate comments to the groups, (c) leading wrap-up whole-class discussions where various groups share their thinking about the problem and the instructor helps everyone to consolidate their thinking about their work. [This type of wrap-up often occurs several times throughout the class period, as well as at the end of each class.]

Before students begin work in their groups, the instructor should talk briefly to the entire class, introducing the activity of the day, explaining any new terminology or special instructions, and indicating how this activity fits into the larger context of the course. Note that this introduction is not a time for telling how to solve the problem at hand: Solving the problem is the task of the students in their small groups. Students will probably be frustrated at first with small group work because they are accustomed to being told by their teachers exactly what to do. By contrast, the problem-solving activities presented in the course challenge students to do their own thinking and the instructor's role is merely to introduce the activity and to guide students to discovering their own solutions.

As the instructor circulates around the room while students are working in small groups, they need to understand that the instructor will play the role of question asker, problem poser, and careful listener, but that they are expected to be the problem solvers and the explainers. Instructors can tell their students over and over that the students must be the problem solvers; but they will only believe it if the instructor demonstrates it by his or her actions in the classroom. Here are some advice we have provided to instructors.

• Don't be an answer giver. Try not to provide right/wrong judgments or to tell students how to proceed on a problem. If you do, they will always be waiting for you to tell them the next time, instead of thinking for

themselves. If students ask, "Is this right?" ask them how they might decide for themselves. Some appropriate replies are "What do your group members think?" or "Can you find another way to verify your answer?"

• De-emphasize correct answers. Try to help students understand that you are more interested in depth of understanding, in ability to communicate mathematical ideas clearly, and in reasonable thinking than simply in correct answers. As you move from group to group, avoid asking "What did you get?" Instead ask questions that require explanation such as "can you tell me what you've been thinking?" or "what strategies have you been using to approach this problem?"

• Be prepared with appropriate hints. There is more than one way to solve nearly every problem. When students are stuck, the instructor may need to provide a hint, but the hint should build on whatever progress the group has already made. For example, if students have been experimenting with specific numbers, it might be appropriate to suggest organizing findings in a table so that a pattern may become more apparent. If students are stuck because a problem has very large numbers or seems too complicated, it might be good to suggest trying some simpler cases first. It is usually not appropriate to provide a hint that merely provides students with the first (or a subsequent) step in a problem solution because this is often tantamount to telling students how to solve the problem.

• Be prepared with problem extensions. Some groups in the classroom will work faster than others. The experienced instructor helps these students (and eventually all students) to think beyond the task at hand. For example, it is often useful to ask students how they would solve the problem if conditions were changed (numbers different, question different, more constraints, etc.) or to ask them if they can work from their specific solution to a solution for a generalization of the problem.

One of the most important parts of the class is the wrap-up discussion that takes place after small groups have worked on problems. Once again, the instructor must guard against playing too prominent a role. There is no point in telling the class how their groups should have solved the problem. An instructor who does this will find that groups soon have no motivation to work on their own: Why should students struggle to work a problem if they know the teacher will explain it later? The wrap-up discussion should be a session where all groups have a chance to tell what approaches they tried, how successful or unsuccessful they were, and what

conclusions they drew from their efforts. The best discussions are those in which the students do most of the talking—comparing approaches, arguing, and trying to convince one another of the validity of their findings. The instructor's role is to orchestrate this discussion so that everyone has an opportunity to participate, so that everyone can hear and understand what others are saying, and so that some closure is reached by the end of the discussion. Although it is important to allow everyone to contribute (even those whose solutions are incorrect), it is also important not to leave students hanging at the end, uncertain what makes sense and what doesn't. At the end of an ideal problem discussion, students will have reached their own conclusions about the validity of various problem solutions and will have a good sense of how the day's work fits into the bigger picture of the mathematical concepts being studied in the course.

Reflective writing. Reflective thinking occurs both inside and outside the classroom. Inside the classroom, students reflect as they work to understand a problem, evaluate their solution processes, decide if their solutions make sense, justify their generalizations, connect mathematical concepts, understand a problem solution different from their own, extend a problem, monitor their thinking processes, and communicate their ideas to other students and the teacher. When students are encouraged and expected to be reflective in their work, they become better at thinking reflectively, their understanding of the content improves, they are more creative and insightful in their problem solving, their motivation for learning increases, and they begin to look for, and make, connections between mathematical concepts.

Outside of the classroom students can continue their reflective activity through reflective writing. Reflective writing benefits students in four ways: (a) therapeutic value, (b) increased learning of content, (c) improvements in learning and problem-solving skills, and (d) change in one's conception of mathematics. Reflective thinking and writing are meaning-making processes that involve the learner in actively building connections between what he or she is learning and what is already known.

In general, there are two broad types of reflective writing assignments that are used in the course to give students the opportunity to reflect on their feelings and thoughts and communicate these in written form. The first type is an assignment that encourages the students to come to terms

with their feelings and beliefs about mathematics. Some examples of this type are as follows:

- Write a brief description of your thinking as you played the games "Poison" and "What's My Number?"
- Discuss how you think mathematics fits with the real world. How do you think new mathematics is created? Has this changed your definition of mathematics?

The second type of reflective writing assignment asks the students to explain a mathematical idea or procedure. It forces the students to ask themselves, "Do I really understand this?" Several examples of open-ended assignments of this type are listed below.

- Explain why the Sieve of Eratosthenes works, in general, in identifying prime numbers.
- What do you consider to be the three most important features of a numeration system? Why?
- Verification is a big mathematical idea. What is the essence of this idea and why is it so important?

Throughout the course, the reflective writing provides a record of the student's development through time, which provides new awareness and stimulus for reflection. This record also allows the teacher to enter into a dialogue with the student by responding to, challenging, and encouraging reflectiveness.

Concept maps. Another vehicle that promotes reflectiveness is the construction of concept maps. A concept map is a representation and elaboration of a concept through the interconnectedness of this concept with other mathematical topics, objects and ideas. For example, using the word "fraction" as the central concept, a web of meaning could be developed that would illustrate one person's understanding of the concept of fraction. Other words or phrases would be linked with the centrall concept to illustrate relationships among the ideas.

Reflectiveness plays an essential role in the course. Without an awareness of oneself as a learner and doer of mathematics (one's mathematical strengths and weaknesses and one's beliefs and attitudes concern-

ing mathematics), there are no grounds for comparing where one is mathematically and the destination to which one might aspire.

Assessment: emphases and practice. The various sources of data for grading in the course are carefully explained to the students. These include: class participation, tests and quizzes, homework, reflective writing, and group projects. From the confluence of these data sources, the instructor assigns each student a grade that indicates the extent to which he or she has reached the goal of the course, namely, to develop good understanding of key mathematical ideas and to be able to communicate these ideas clearly and efficiently to others.

Yet instructors should not think of assessment merely in terms of assigning grades. Another just as important reason for assessment is to help the instructor build an accurate mental picture of the understandings held by students and to enable him or her to adjust instruction accordingly. Thus, assessment is an ongoing process in the classroom. Whenever the instructor is circulating throughout the room during small group work, he or she should be assessing the progress of the various groups, trying to get a picture of student understandings, and making mental plans so that the wrap-up discussion or the next day's lesson may be orchestrated to help students deepen their understandings. Another source of assessment data for the instructor is the students' reflective writing. By reading students' writing an instructor gets additional insight into which topics have been understood and which need more attention or a more focused discussion.

Still another reason for assessment is to indicate to students what is considered important. Because being able to communicate about mathematics is an important goal of the course, instructors must allow sufficient time for students to talk about mathematics and to write about it. And they must offer thoughtful reactions to students' communicative efforts, so that the students can see that their efforts to explain their ideas are valued.

Teacher's and students' roles in the course. University students have experienced years of training in which the teacher was the authority and the teacher's word was as close to the "truth" as was possible. As a result, many of our PSTs expect the teachers to tell them what to learn and how to learn it. That is, they have not developed autonomous learning behaviors of the type that we want them to help their future pupils develop.

The role of the teacher in a course such as this one is not easy. On one hand, a teacher who gives detailed directions may be sending the message that students are to be dependent on the teacher for all knowledge. But a teacher who gives almost no direction increases the possibility of student frustrations rising to a debilitating level. The teacher needs to adopt a balance, sensing when to intervene and redirect student exploration and when to allow the student to stumble along. This is not an easy task. The teacher's role is not that of an authority but more that of a guide. The teacher chooses which problems and activities to use as a means for introducing material and guides the discussion of these problems, but the teacher does not pronounce solutions. This is somewhat contrary to what has been considered appropriate teacher behavior in the past.

In this class, a heavy reliance on cooperative learning removes the teacher as the authority figure and minimizes the possibility of students blindly emulating the teacher's modeled techniques and solutions. Students are forced into helping each other develop their own deeper understanding of mathematical principles and mathematical autonomous learning behaviors.

The overarching responsibility of the teacher is to establish a mathematical community in the classroom where everyone's thinking is respected and in which reasoning and discussing mathematical ideas and meanings is the norm. Within this community, the teacher's insightful questioning can play an important role in stimulating student thinking so that there are opportunities for students to examine and question their beliefs about mathematics, to have their misconceptions challenged, and to seek clarifications, strategies, and verifications without direct teacher intervention.

The traditional mathematics classroom is teacher-centered. In a typical teacher-centered class, the first activity is for the teacher to check answers for the previous day's assignment. Second, the teacher or students work the more difficult problems at the chalkboard. Then, a brief explanation is given by the teacher of any new material and problems (exercises) are assigned for the next day. The remainder of class is devoted to working on homework while the teacher is available for answering questions. This type of instruction implies that there is specific mathematical knowledge that the teacher has and that through copying what the teacher does and through passive absorption, students will acquire this knowledge.

Research findings, however, indicate that learning occurs as students actively assimilate new information and construct their own meanings (Grouws, 1992; Wilson & Lester, 1994). Students engage in a great deal of invention in learning mathematics and impose their own interpretation on their experiences. Knowledge and understanding are developed through active learning. Consequently, each student's knowledge of mathematics is uniquely personal. This means that mathematics classrooms should be more student-centered. To understand what they learn, students must enact verbs that permeate all classwork: examine, represent, hypothesize, solve, communicate, prove, etc. This happens most readily when students take charge of their own learning.

As we envision the classroom, the students' role must be an involved, active one. Students are expected to listen to, respond to, and question the teacher and one another. They should also be reflective thinkers to become aware of how they themselves learn mathematics. The validity of particular representations and solutions should be determined by mathematical evidence and argument, whether students are working in large or small groups or even individually, but not by seeking the "right" answer from the teacher. It is probably inevitable, then, that some student frustration will arise in this environment because of prior student beliefs about the nature of mathematics and expectations about the proper role of the teacher. It is ultimately the task of the student to try to make sense of his/her mathematical experiences.

Some concluding thoughts

> *Those who would teach mathematics need to learn contemporary mathematics appropriate to the grades they will teach, in a style consistent with the way in which they will be expected to teach.*
>
> *All students, and especially prospective teachers, should learn mathematics as a process of constructing and interpreting patterns, of discovering strategies for solving problems, and of exploring the beauty and applications of mathematics.* (*Everybody Counts: A Report to the Nation on the Future of Mathematics Education*, 1989, p. 64, p. 66)

The two quotes shown above are taken from a report written approximately 10 years ago for the United States' National Research Council by a group of concerned mathematics teachers. The authors of the report insisted that it

was time to change the way that mathematics was taught at all levels, kindergarten through university. Since this report was written, the nature of mathematics instruction has begun to change, although the change has been excrutiatingly slow. In the past, mathematics instruction was viewed by many as an activity in which an "expert"—usually the teacher—attempted to transmit her or his knowledge of mathematics to a group of students who usually sat quietly trying to make sense of what the expert was telling them. This passive transmission view is gradually being replaced by a new view in which mathematics is seen as a cooperative venture among students—a venture in which they are encouraged to explore, make and debate conjectures, build connections among concepts, solve problems growing out of their explorations, and construct personal meaning from all of these experiences. By adopting this new view, one also adopts a new way of thinking about the sort of collegiate mathematics instruction prospective elementary teachers should experience. What we have shared with you in this paper is, we hope, consistent with this new view.

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Individual Differences in the Criteria of Optimal Readability of Textbooks

Jaan Mikk

Every teacher knows that learning is most effective if the students have to exert themselves and if they are successful. If the learning tasks are too easy, then the students will learn to become lazy. Too complicated and capacious learning tasks may damage the students' health if the students try to fulfil the tasks correctly. Mostly they will not, they will end up with thoroughful learning and their knowledge and abilities will develop very slowly. To achieve the most rapid development of students' knowledge and abilities, the learning tasks should be a little bit ahead of the actual level of students development so that students might manage the tasks with some help from their teachers. The learning tasks should be in the zone of the proximal development of students (Vygotski, 1956).

The assertion above can be taken as a ground for the definition of optimal readability of textbooks. Optimal readability level of textbooks is the level that corresponds to the zone of proximal development of students. The students can acquire the content of optimal textbooks with moderate efforts, their knowledge and abilities develop most rapidly and they cognise their success.

Readability of textbooks is measured by readability formulae. The formulae predict the level of a comprehension of textbook by students. The formulae use some simple and important text characteristics as predictor variables. Let us have three examples of the formulae.

1. One of the most popular readability formulae for the English language is the formula developed by R. F. Flesch

   RE = 206.835 - 0.846wl - 1.015sl,

where: RE - reading ease score,
wl - the number of syllables per 100 words
sl - the mean sentence length in words.

The Reading Ease index varies from 0 (a very complicated text) to 100 (a very comprehensible text (Tuldava, 1993).

2. Osmo A. Wiio developed the following readability formula for the Finnish language

$$GL = 2.7 + 0.3\,LW$$

where: GL - grade levels 1-12 in the Finnish schools,
LW - long words of 4 or more syllables in their root form per 100 words (Wiio, 1968, p. 78).

3. The most popular readability formula for Estonian is as follows

$$C = 0.131x_1 + 9.84x_2 - 4.59$$

where: C - text complicacy,
x_1 - independent sentence length in letter spaces,
x_2 - abstractness of repeating in text passage nouns according to the following three stage scale:

1 - nouns signifying directly perceivable objects,
2 - nouns signifying perceivable activities and phenomena,
3 - nouns signifying directly imperceivable notions.

There are many readability formulae in use besides the three examples. Most of the formulae predict the comprehension in grades as O. A. Wiio's formula. It means that the calculated grade level indicates the reading ability level needed for the comprehension of the text satisfactorily. The formulae solve the problem of optimal readability in general: a textbook is optimal for a student if the textbook's readability grade level corresponds to the students' reading grade level.

Teachers know that students in a classroom are very different. Some students have more knowledge and are more capable than the others. According to our previous discussion the students in a classroom should have textbooks with a different level of readability.

The aim of the paper is to investigate the individual differences of students in a grade and the differences in textbooks' readability needed for the optimal development of students in a grade.

Individual differences of students.

Let us begin with **verbal abilities** that have a big influence on text comprehension. For example, P. Kees (1977) has measured the abilities of students from the second to the eighth grade. He has received the following results for the ability of students to write in a minute as many words as they can. The words had to begin with a given letter. The results of the test are in Table 1 and in Figure 1.

Table 1. Number of words, beginning with m, written by students in a minute (Kees 1977, p. 36).

Grade	2	3	4	5	6	7	8
Number of words	4.7	6.2	7.3	8.7	9.5	9.8	10.9
Standard deviation	1.8	2.3	2.8	3.0	3.5	3.0	3.3

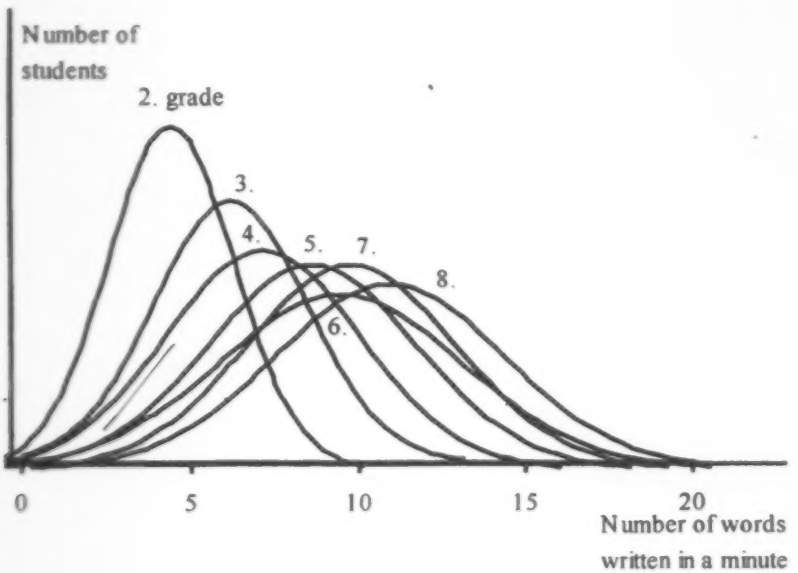

Figure 1. Overlapping of results of a word fluency test in different grades (data from Table (1).

We see individual differences of students in comparison with differences between grades in Figure 1. For example, many students in the fifth grade had results lower than the mean result in the fourth grade and some students in the fifth grade had a result lower than the mean result in the third

grade. On the other hand, many students in the fifth grade reached the result higher than mean result in the sixth grade and some had a result even higher than in the seventh grade. The differences between students in a grade are bigger than the differences between average results in succeeding grades. In other words: some students in the fifth grade can acquire textbooks with readability on the sixth or even the seventh grade level and some students in the fifth grade need textbooks on the fourth or even the third grade level. Of course, the same is true of students of other grades.

Let us generalise the data in Table 1. The mean standard deviation in the test was 2.8 and the mean difference in the average results of successive grades was 1. The mean difference between successive grades was 2.8 times smaller than the standard deviation of results in a grade.

How many students have the result in one standard deviation higher of the average result in the grade? To answer the question, we can base at the normal distribution. According to the distribution the most able third of students is about one standard deviation above the arithmetical mean in the grade. On the other side, the less able third of students is about one standard deviation behind the average result in the grade.

Summarising the two last paragraphs, we can say that the most able third of students in a grade was about three grades ahead of their classmates in the word fluency test made by P. Kees (1977). One third of most able students need textbooks with the readability three grades higher than the average readability in the grade.

P. Kees (1977) has made five tests in two versions for the seven grades. Generalised results of his tests are in Table 2. We see in the table that, on average, the standard deviation of results in a grade is 2.9 times bigger than the mean difference between the results of successive grades. The table supports the conclusion drawn in the previous paragraph. The optimal readability of textbooks for different students in a grade varies in six grades.

Table 2. Standard deviations and mean differences of ability tests in Estonian schools. (Kees, 1977, p. 36; Värs, 1998).

Test version	Test No	Test content	δ	Mean difference	Ratio of δ and mean difference
I	1.	Word fluency	2,8	1	2,8
	2.	Story memory	3,4	1,65	2,1
	3.	Acquiring of new words	12,6	5,2	2,4
	4.	Composing of names	3,2	1,01	3,2
	5.	Finding a rule	1,7	0,5	3,4
II	1.	Word fluency	2,75	1,01	2,7
	2.	Story memory	4,65	1,55	3,0
	3.	Acquiring of new words	12,5	4,32	2,9
	4.	Composing of names	2,99	0,85	3,5
	5.	Finding a rule	5,39	1,96	2,8

M. Värs (1998) has analysed the results of the Raven test for children. She found that the mean standard deviation was 1.9 times bigger than the average difference between the results of children born in successive years. We see that the most able third is about two years ahead of their classmates.

Z. M. Istomina (1976) has studied the memory of 5- and 6-year-old children. She found that the increase in the ability of memorising words was in a year 0.8 words and the standard deviation was 0.9. Consequently, the most able third of five-year-old children can memorise words on the level of the sixth grade children. Analogical results were received by N. M. Gnedova (1976) while studying the verbal and pictorial memory of 3-6-year-old children. The standard deviation of results was 1.5 times bigger than the mean difference between years. V. I. Samohvalova (1976) studied the ability of elementary grade students to use the classification while memorising the learning material. The difference between the results of students in successive grades was 0.37 words and the standard deviation of results in a grade was 1 word. Once again we see that the most able third of students is three years ahead of their age mates. Students in a grade need textbooks with different readability.

Besides abilities the **vocabulary** of the reader has a big influence on reading efficiency. More advanced vocabulary enables to read with a higher effectiveness. Big differences have been found in the vocabulary size of different people. For example, the vocabulary of the school beginner

may vary from 3,000 to 48,000 words (Kraav, 1969). The vocabulary of the fourth grade students varies from 10,200 to 65,400 words (Tamm, 1972). The ratio of the last numbers (6.4) coincides with some evaluations below but the first numbers seem to be the extreme values that are not very reliable.

Recently J. Bast has studied individual differences of elementary school children. He has made vocabulary tests A and B with the first grades in November and with the same students in the third grade in June. The standard deviations of the results were correspondingly 3.6 and 5.0 in a grade. Average increase (calculated per year) in vocabulary test results was 2.7 and 4.2 correspondingly. Consequently, the standard deviation of the vocabulary test results is 1.25 times bigger than the difference in the results of successive grades.

The next important factor of learning efficiency is **learning time**. W. C. Frederick & H. J. Wallberg (1980) concluded in their survey of the relationships that the learning time correlates with the learning results as high as the level of the mental abilities. M. Gettinger and M. A. White (1979) have found in their experimental research that the time to learn correlated with the achievement on level 0.85 - 0.89 while IQ quotient had a correlation with the achievement 0.59 - 0.76. The more students spent time on learning, the higher the level of acquiring.

Different students need different time interval to study a lesson. M. Lepik (1988) observed that the most able third of the seventh grade students solved 2 verbal problems within the time the average third of students solved one problem. The less able third of students needed twice as much time as the average third to solve a fixed number of problems. Consequently, the less able third needs four times more learning time than the most able third. M. Arlin and J. Webster (1983) have found the difference 2.5 times in the learning time in the mastery student groups. Other researchers write that 10% less able students need 5-6 times more learning time than 10% most able students (Frederick & Wallberg, 1980). According to the normal distribution the average time needed by 10% of the most able students is 1.7 δ lower than the average time. Consequently, the most able third of students acquires a study material 1.6 times faster than an average student.

We see that the time needed to acquire a lesson differs significantly from student to student. If the less able students have no extra time, then

the learning tasks for them must be less complicated. Most able students must often wait until their classmates complete their tasks. To avoid the wasting of time, the able students should have more complicated textbooks.

Reading comprehension is an important characteristic of the efficiency of textbook use. J. W. Bast has studied the development of the ability from the third to the sixth grade in schools of Holland. Average increase in the reading comprehension ability from grade to grade was 3.83 points and average standard deviation in the reading comprehension ability in the grades was 5.53 points (Bast, 1995, p. 77). We see that the most able third of students are about 1.5 grades ahead of their classmates.

The above analysis of the individual differences of students resulted in various data. Obviously the relation of standard deviation of the ability in a grade to average increase of the ability in a year depends on the ability considered. We saw the most striking differences in verbal abilities and the learning time, the moderate differences were in memory and in vocabulary. Teaching methods and learning habits may also influence the difference between students and so the ratio of standard deviation to increase the ability in a year may be different in different countries.

To summarise the different data overviewed, we accept that the standard deviation of the students' reading ability is twice as big as the average increase in the ability in a year. The assumption will be laid as a foundation for the following calculations.

Differences in the criteria of optimal readability

Our main conclusion from the previous overview was that the differences between students in a grade are bigger than the differences between average results in succeeding grades. The conclusion holds for optimal readability levels as well. Some students in the 5th grade can understand textbooks at the 6th or the 7th grade level and some 5th grade students need textbooks on the 4th or the 3rd grade level. Let us look at the criteria in some detail.

To have concrete data, we will consider 5th grade students in our discussion although the calculations can be made for other grades as well. The ground for the discussion is the conclusion that the standard deviation of the reading ability is twice as big as the average increase of the ability from a grade to the next one. The conclusion is depicted in Figure 2 as fol-

lows: the standard deviation of the 5th grade students holds mean abilities of the two succeeding grades. For example, the abilities from 0 (included) to 1 (excluded) hold the abilities of the 5th and the 6th grade students. Every level of abilities is connected to the cumulative percentage of the 5th grade students who have abilities below the level (Figure 2). Relying on the data, we can calculate the percentage of the 5th grade students whose ability level is on the average level of different grades (see the last line in Figure 2). The ability level determines the optimal readability level of the textbooks for the 5th grade students.

We see in Figure 2 and Table 3 that the optimal readability level of the textbooks for the 5th grade students reaches from the second grade up to the eighth grade or even more. The textbooks for students in a grade should be very different to meet the criteria of optimality.

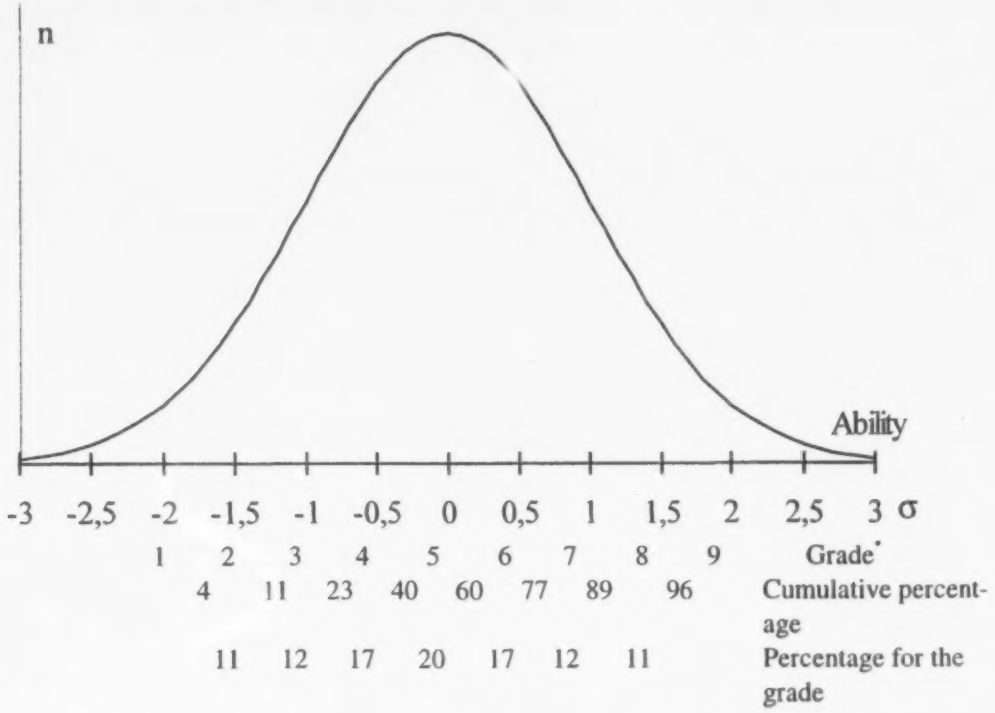

Figure 2. Determining the percentage of the 5th grade students with abilities at different grade levels.

* grade level in which students have mean abilities on the level.

Table 3. Optimal readability grade levels for the 5th grade students.

Optimal readability grade level	Percentage of students in 5th grade
2	11
3	12
4	17
5	20
6	17
7	12
8	11

Table 4. Optimal values of text characteristics for the 5th grade students.

Percentage of students in 5th grade	Sentence length in words	Abstractness of recurrent nouns	Percentage of personal words	Optimal word length in letters	Percentage of monosyl-lables
11	6	1.0		3.5	
12	7	1.0		4.0	
17	8	1.1		4.6	54
20	9	1.1	19	5.2	51
17	10	1.2	14	5.7	49
12	11	1.2	10	6.0	48
11	12	1.3	6	6.3	46

For a better understanding of the differences in the criteria of optimal readability let us look at Table 4. We see in the table that 11% of the 5th grade students need textbooks where sentences are mostly not more than 6 words long. 12% of the 5th grade students can easily read textbooks written in sentences mostly below 7 words, e.t.c. The most able 11% of the 5th grade students need for their optimal development the texts written in sentences up to 12 words. The optimal sentence length for most and less able 11% of the 5th grade students differs from 6 to 12 words. Big differences in other characteristics are also seen in Table 4.

The data in Table 4 are to illustrate the differences in optimal values of text characteristics for the students of a grade. The data are not for speedy application in Finnish, while the table is composed on the basis of research in different languages. Optimal sentence length and abstractness

levels are elaborated for Estonian. The optimal percentage of personal words was given by R. Flesch (1946) for English. The optimal values of word length and monosyllables are based on the investigations by R. Bamberger and E. Vanecek (1984) for German.

There is one more reason to be cautious with data in Table 4. We could find very little data about the differences in the reading speed and comprehension. So we used the data about verbal abilities and even the speed of problem solving. Thorough comparison of individual differences in the reading ability with differences between grades may change the data in Tables 3 and 4.

We see that different students in a grade need different textbooks. The need has been understood in many countries.

A. A. Èebotarjov (1985), V. I. Daineko (1985), and M. N. Skatkin (1991) have proposed to write **textbooks on three levels**. The first level textbook contains the minimum of material and the presentation of the material is popular. For example, in a physics textbook making use of physics in every day life and concrete examples are preferred to scientific discourse. There is no mathematics on this level of a physics textbook. The second level contains, in addition to the first level material, also mathematical calculations, the discussions of the experiments and the conclusions from them. On the third level, the connections of the study material with the fundamental scientific theories are discussed as far as some additional concrete problems and their practical applications are concerned.

I have seen history textbooks on three levels in Germany. The levels differed in the amount of study material: the higher levels contained more text and more material. The basic text was the same for the three levels. If the publishing house accepts the three-levels textbooks characterised in previous paragraph, then not only the amount of study material but its readability as well will be different for different students in a grade.

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The Pathic of Pedagogical Practice

Max van Manen

Mark, my 19 year old son. Mark, the violinist, possesses this gorgeous athletic muscular physique. Mark says that he could never love a girl unless she has a beautiful body. Indeed the girls he dates are always smashing. Sure he also wants his girlfriend to be kind and wonderful in other respects; but the body is important, very important. She better not be out of shape, fat, sloppy, too skinny, or too big.

Well, the other night my teenage son Mark was watching with us on television this 40 year old black woman singing Gershwin with the San Francisco Philharmonic (I think it was). And Mark, the musician, was clearly stirred by the magnificent voice and persona of the black singer, supported by this fine orchestra. But when it was over Mark sighed and said, "You know, I could fall in love with a woman like that!" And there was this woman applauded by the audience: she was broadhipped, well bellied, full bodied - not exactly a replica of Mark's dreamgirl. Yet, he was totally swept away.

Later I wondered: what did Mark experience? Now, Judith, my wife would say lust. At his age it is mainly lust. I cannot, dare not, disagree with her, but I think there is more. Though I am not quite sure how to describe it. Perhaps, with her voice the black singer opened a space, a world to which Mark feels he deeply belongs. Perhaps she made available to him something of himself, his musical self. Or perhaps her whole persona quickened his youthful body to respond with an enchanted sensuality.

We could assign words or concepts to Mark's experience (lust, admiration, enchantment, emotion) but these would be simplifications; in truth, they would be lies, obstacles to understanding his experience. And yet, perhaps some of you feel that you may understand something of Mark's experience. The point is, that this understanding is not primarily conceptual, intellectual, or gnostic. No, this understanding is pathic, in some sense noncognitive. And this is in part what I would like to make topical for the present. I would like to state as well from the outset that I am quite traditional in my view of what a good teaching is. I would agree with Professor Kansanen that the knowledge base of teaching includes theories, technolo-

gies, models, rules, recipes, and routines. But, like he and his collaborators on the text "Teachers Pedagogical Thinking," I have become more and more convinced that in addition the real excellence, the secret of outstanding teaching consists in forms of knowledge that we are only now beginning to understand. For the present I would call this knowledge pathic because it is not accessible, communicable, and teachable in the same way as the more cognitive dimensions of the teachers' knowledge base.

The term *pathic* derives from pathos, meaning "suffering and also passion." In a larger life context, the pathic refers to the general mood, sensibility, and felt sense of being in the world. Buytendijk (1970) draws a close relation between the pathic experience and the mood of the lived body. The pathically tuned body perceives the world in a feeling or emotive modality of being. Similarly, Heidegger used the notion of *Befindlichkeit* to refer to this sense that we have of ourselves in situations. Literally *Befindlichkeit* means "the way one finds oneself" in the world (1962, pp. 172-188). We have an implicit felt understanding of ourselves in situations even though it is difficult sometimes to put that understanding into words.

The challenge of the pathic

Due to recent budget restraints, many schools of education across Canada have taken initiatives that involve fundamental restructuring of their teacher education programs. A common concern that has shaped many of these changes is the realization that the practical or internship component of teacher preparation is a key to program improvement. A shared belief that underlies this concern is that in the practice of teaching there are epistemological factors operating that we may not quite understand but that seem to be responsible for more effective developments in the teacher's personal practical knowledge. Story telling, narrative records, reflective journals, guided analysis, focus sessions of critical incidents are some of the techniques that are being employed in attempts to tap into the "secret" domains of this epistemology of practice. One has come to the realization that there exist forms of knowledge that are conditional for excellence in teacher professional performance. And these knowledge forms are or not necessarily surveyable, measurable, or charteable in terms of the familiar domains of cognitions, affects, and skills. The realization that we must be open to more pathic, embodied, noncognitive aspects of the epistemology

of practice is evident in new research that focuses on such more elusive dimensions of professional development as teacher identity, reflective being, pedagogical virtues, teacher qualities, moral practice, and pedagogical thoughtfulness and tact.

The point is that from a pedagogical point of view teaching amounts to much more than what North Americans describe as "delivering the curriculum." Teachers are more than technicians in cognitive enterprises, and more than postal workers whose main task is to deliver the mail, most of which is junk-mail anyway. Teachers are persons and moral agents who carry pedagogical responsibility for the children or students under their purview. As teachers we always stand in relations of influence to our students. And in recent years we have become more reflexively aware of the pedagogical and moral significance of this influence. We know that we cannot not influence our students. So the question is not whether we should or should not influence our students. We always do. And in The Tact of Teaching (Van Manen, 1991), I have tried to show that this influence is osmotically derived from everything we do and don't do, and from our entire being: the way we are, feel, act, understand, as well as our reflexive awareness of our interpretive being. In other words, we are not only responsible for what we do but also for what we know and how this knowledge gives us a view of the world. Every word and waver, every glance and gesture, every grin and grimace are enacted in the instance of concrete situations. When I talk with beginning as well as with experienced teachers they generally agree that this is the most challenging dimension of teaching, and yet this is also the dimension that is virtually absent in the professional knowledge base of teaching.

In the restructuring of programs there sometimes are strange consequences or effects that are incidental but fortuitous. For example, a colleague recently reported how at her university the student teachers majoring in different subject areas are now grouped and supervised together in one high school with one faculty representative. The serendipitous effect is that the faculty member who may be, for example, a professor of science education now must observe and assist student teachers who are majoring in other subjects such as English, social studies, music, second language, mathematics, drama, or art. No longer can the science professor focus primarily on the subject matter aspects of teaching science. In other words,

what happens is that the new practicum program arrangement forces a different perspective on the staff.

So, one difference is that the subject matter expert has to observe, assist, and evaluate student teachers out of their own subject field. He or she must now develop a discerning eye and ear for the more relational and interactional dimensions of teaching. And what happens is that some university professors who are supervising student teachers out of their own subject are unwittingly adopting a more pedagogical perspective. Why? Because—instead of looking primarily at didactical or subject matter instructional strategies—they now have to look at any moment of classroom life, and ask: is this teacher acting appropriately here? At this moment? In this situation? With this student? Is this incident handled well? Or could it have been done better? In other words, the teacher educator is now constantly looking to distinguish good from not so good student teacher behavior, more appropriate from less appropriate examples of dealing with classroom events, students, and student learning. This shift toward perspectives which are essentially personalistic, relational, normative is also aided by the increasing discomfort that educational thinkers and leadership feel with present day preoccupations with corporatist, technicist, and measurement oriented developments in school management, curriculum policy, and technology based teaching and learning.

Another difference is that the faculty person tends to become more attuned to the essentially contingent nature of classroom life. It is this contingent quality of the practice of teaching that ruptures the planned courses, lessons, activities and routines of classroom life, but also gives shape to them. Teachers always operate in the context of ever changing circumstances of daily day classrooms. The rationalist, managerial, and technological vocabularies in educational inquiry and policy making (see addendum) have prevented researchers and theorists to see what every teacher knows: that the rationalistic assumptions that inhere in teacher decision making models and reflection-in-action models (as described in the teacher-thinking literature) are practically, psychologically and epistemologically contradicted. One cannot be actively and meaningfully involved in relations with other persons while simultanously reflecting on the possible alternatives, soundness, intents, consequences of one's inter-actions in these situations. Reflection-and-decision-making--in-action may be highly desirable in subject-object relations, such as in the case of engineering, but

it does not fit the dynamics of subject-subject relations—except, of course, when we do treat students as objects, which does happen in school perhaps too often.

Now, when we ask students to describe their classroom experiences with teachers, it becomes immediately evident how they often see teaching in terms of style, personality, and qualities such as fairness, patience, commitment, approachability, and kindness. In a project aimed at discovering how students experience the interactive dimension of teaching, the narratives collected from these students are strongly suggestive of pedagogical qualities that students appreciate or criticize in their teachers. Here is an example that I have used before, but that seems particularly eloquent in expressing the more pathic aspects of the teaching-learning process:

> My science teacher in grade 10 had quite an effect on me. I especially liked his enigmatic grin whenever he was demonstrating a science experiment or when we were trying to understand some physics phenomenon. He always seemed even more amazed than we were about the strange ways of nature. Science became something extraordinary.
>
> I remember one day, it was early in September. The first school term had just started. As our new science teacher walked into the classroom a narrow beam of sunlight reflecting from an upper window had landed on the front wall board. Some kids were making up jokes about it. The bright reflection almost hurt my eyes.
>
> The teacher took immediate notice of it. He stood still and regarded the phenomenon with a wondering kind of smile. He stood there so intently staring at the light that the whole class became silent. Now everybody stared puzzled at the strange blast of sunshine. The upper shaft drew a sharp long triangle, like a huge finger pointing at something. That day our lesson was about reflection and prisms.
>
> After a few minutes the sunbeam suddenly disappeared as if someone had turned off the light. The teacher pointed out that the next time we would see the giant sunray, in the spring, the course would be in its final stage and we would be reviewing what we had learned during the year for our final test.
>
> "In this class we go by cosmic time,Ó he pronounced quietly. A smile hovered around the corners of his mouth and his eyes. I was transfixed. Some kids laughed knowingly. I did not quite understand what he meant, but it sounded intriguing, like almost everything he said and did in class.
>
> The year flew by fast because we worked very hard for our science teacher, not wanting to disappoint him. I think that everybody enjoyed the lessons, the labs and assignments in which we were involved during the year.
>
> It was quite a shock when one day we were greeted, again, in the science room, by an incredibly brilliant ray of light, plunging, as if by witchcraft, from the upper light boxes. The beam descended in a blazing brightness in exactly the same location on the board, reflecting from its surface like from a polished mir-

ror. It made me think of a giant exclamation mark. As if it were bringing us a secret message.

When the teacher came in he abruptly stopped; with his arms folded he stood there, glancing enigmatically at the sunbeam's dazzling reflection on the board. We could not help but smile with him. It was as if we were in conspiracy with our teacher about its magic appearance.

Then he nodded his head solemnly; he reached into his desk and, without any further ado, he began to distribute the study review notes for our final test.

I felt sort of sad—as if I was about to finish a good book.

(Grade 11 student)

Students were taught to write and edit anecdotes like this. For the purpose of anonymity and plausibility some further editing was sometimes done. The following suggestions were given to enhance the narrative power of anecdotes:

1. An anecdote is a very short and simple story
2. An anecdote usually relates one incident
3. An anecdote begins close to the central idea
4. An anecdote includes important concrete detail
5. An anecdote often contains several quotes
6. An anecdote closes quickly after the climax
7. An anecdote often uses punctum for punch line

I would like to draw your attention to the effective closing lines in this anecdote. They certainly seem to achieve the quality of, what Roland Barthes (1981) calls "punctum" (point) the sense that we have been touched by something—an image that is really a pathic understanding. Barthes developed the idea of punctum in his text *Camera Lucida*. When we take pictures with a camera then most may just be snap shots. And sometimes, among all those shots, one picture stands out: this is a photograph! A picture is a real photograph when it appears to possess punctum, it shows something that strikes us and compels our attention. But this is also true of texts. Literally, parts of the text that possess punctum prick us, hurt us, touch us. Much writing is simply plain narrative. But some texts possess punctum. They move us, stir us. These texts turn evocative when they manage to invoke meanings that may affect the reader in certain ways.

Some stories that students tell are straightforward; other anecdotes are more intriguing. But in almost all cases there is a strong sense of relationality involved in the descriptions. The way that the teacher relates to students is a dominant theme.

> During attendance some of us were sitting quietly while others were talking. One student, Han, was talking so loudly that we could hardly hear our names being called. Mr. Rendel kept asking him to be quiet, but after a few moments his voice would boom loudly through the classroom again.
>
> Finally, Rendel threw his attendance folder on the desk and glared at him: "Han, get out!"
>
> Now he had Han's attention. Han turned slowly in his chair and gave the teacher a stony stare. "You get out, asshole."
>
> All eyes turned toward Mr. Rendel, who was straining to control his temper. His face had turned red and he was clenching his fists. Then he said the most unbelievable thing: "You're the asshole. Pick up your books and go see your grade coordinator now."
>
> When Han had gone, we all looked at the teacher in disbelief. "Why did you swear back?" I then asked.
>
> Mr. Rendel picked up the attendance again in a business-like fashion. "If someone smiles at me I smile back. I treat students the same way they treat me."
>
> I could not help but smile at him, understandingly.
>
> (Grade 9 student)

Note, how with this last line the student seems to communicate a mixed message. She understands the teacher's explanation. It is hard sometimes to say the right thing in the spur of the moment. She may even agree with the teacher's response. But there is also the sense of ambivalence. The student's understanding smile acknowledges that the issue is propriety, seemliness, aptness, in other words, the ethics of pedagogical appropriateness.

I have collected dozens of student anecdotes of moments of classroom life and they all show that students do tend to look at teacher actions in terms of appropriateness. But this is a difficult topic to describe directly. I just noted that teachers ongoingly have to act in the spur of the moment. And in doing so they have to avoid being impulsive, insensitive, thoughtless, tactless. And yet, it is unrealistic to expect that teachers reflectively make rational decisions regarding everything they say and do. In short, teachers actively have to distinguish what is good from what is less good for the students for whom they have responsibility. This normative or moral principle of pedagogy has been long-accepted by proponents of the pedagogical traditions. And in response to prevailing technicist, corporatist, consumerist, and postmodernist trends in education, counter trends are developing that aim to restore the moral agency of teachers. Contemporary observers are suggesting that literally every aspect of their behavior and presence in class has moral consequences. This has recently been excellently documented in studies by Philip Jackson (1993), John Goodlad (1991), Hugh Sockett (1993) and others. They have shown that everything

teachers do has moral significance, and that what teachers lack, is a moral language in terms of which they can reflect on their experiences with students. Now, what I find somewhat ironic is that Dutch, German, Belgian, and Scandinavian educational traditions have long cultivated such normative or moral language—it is called the theory and practice of pedagogy.

Writing from experience

It is obvious that students know how to write about their classroom experiences. And they often write with a vividness and engagement that gives these writings a certain evocative power.

It can be argued, both at the practical and at the philosophical level that certain qualitative forms of writing create conditions for re-experiencing our experiences, for becoming conscious of our feelings and understandings, for encountering and generating insights, and for reflecting on the meaning and significance of our experiences.

I don't know about you, but often when I ask students (including my own children) about their experiences at school, they are likely to reply something like: fine, or a drag, or boring. But there are also times at home when my kids will uncannily imitate their teacher or some student when they feel like talking about school situations. Obviously, young people are very capable in presenting with words and gestures everyday events of classroom life. So what I have done with students is to teach them a way of writing about their experiences that enables us teachers to inquire further into the relational, situational, and ethical dimensions of classroom life. This writing is empowering for students too. It enables them to become aware of their experiences, to confront them, and to interpret them.

The following piece of student writing is admittedly somewhat unusual in terms of the event described. But I am struck how this girl is able to communicate a mood that is difficult to name and yet recognizable and understandable.

> I sat somewhere in the middle of the room and to the side, the side by the windows where I could look out and catch a glimpse of blue above the towering redbrick walls of the courtyard. French class was always a struggle and so it was necessary to find a seat where I had something—the window and the patch of blue sky in this case'to divert my attention. The sky would transport me away when the teacher, Mr. Nadeau, lost control of the class, as he inevitably did.

> I turned to the front and cast an appraising glance over him. He was losing it now. The group had begun their games: rude noises, paper balls and flying erasers this time. It was only ten minutes into the period and he was already working his hands, a sure sign. He had grasped his right hand in his left and was kneading his palm with his thumb nervously.
>
> "Mademoiselles et messieurs," he pleaded, "S'il vous plait! S'il vous plait!" His face was reddening and a visible tremble had crept into his hands so that he clasped them together even more tightly—so much so that his fingers began turning white. He was nearing it now. Soon he would blow up and lecture us about our immaturity. Then he would stop teaching altogether and assign us a page or two in our workbooks. The bullies would have won again. Once he had given us the work time they would be free to do as they pleased as long as they were controlled enough not to incite another lecture.
>
> I watched Nadeau, frail, nervous. It was almost too much to bear, seeing a grown man lose his composure. Just then an eraser flew through the air past me and narrowly missed the side of his head. The time had come. I found my piece of sky so that I wouldn't have to watch the final stages of his defeat.
>
> But something strange happened that day. Instead of the usual tirade in English—he always spoke in English when he scolded us—he became completely silent. I turned my head slowly toward him, hardly daring to look. The class had gone unusually quiet. Monsieur Nadeau stood, stooped forward, his shoulders shaking and his hands to his face. He said nothing to us, he merely turned and shuffled out of the room.
>
> My chest tightened and I gulped down a sob. I turned to the window and, through a glaze of tears, watched a wisp of white cloud gently make its way across my piece of sky.
>
> (Grade 9 student)

What we may gain from these student descriptions is an understanding of school life that is less easily presented in the more common discursive forms that we meet in observational accounts by educational researchers. The philosopher Gendlin suggests that this kind of understanding is not cognitive in the usual sense. It is pathic. He says: "It is sensed or felt, rather than thought - and it may not even be sensed or felt directly with attention" (Gendlin, 1988, p. 45). And yet, our sense of the pathic in our own or in other people's existence can become a topic for our reflection. The important point for phenomenological inquiry is that cognitive insights by themselves cannot address noncognitive or pathic meanings. Thus we need to employ noncognitive or pathic methods in order to address lived experience.

On first glance I am using the term pathic as in em-pathic, sym-pathic, and tele-pathic. Empathy, sympathy, telepathy are usually discussed as certain types of relational understandings that involve imaginatively placing oneself in someone else's shoes, feeling what the other person

feels, or to be understandingly engaged in other people's lives. I will suggest that there are other modalities of pathic understanding. But the first important point is that the terms empathy and sympathy bring out that this understanding is not primarily gnostic, cognitive, intellectual, technical—but rather that it is, indeed, pathic, that means situated, relational, embodied, enactive.

Now, it is much easier for us to teach concepts and informational knowledge than it is to bring about pathic understandings. But it is only through pathic images accessible through certain types of texts that the more noncognitive dimensions of our professional practice may be communicated, reflected on, and internalized. For this we need to develop an epistemology of practice that is sensitive to the thoughtfulness required in contingent, ethical, and relational situations.

To reiterate, the practice of teaching is so challenging, not only because it is cognitively complex, but also because the knowledge that inheres in our practices is, in part, pathic or noncognitive. And it may be this pathic dimension of practice that continually challenges us in our efforts to develop a knowledge base for teaching.

Pathic aspects of practice

I have suggested that there are modes of knowing that inhere so immediately in our actions, in our body, in our relations, and in the things around us that they seem invisible (1997). This is how I would make sense of these modalities of pathic knowing:

noncognitive or pathic aspects
of epistemology of practice

- Enacted knowledge
  We discover what we know in what we can do
- Embodied knowledge
  We discover what we know in our embodied being
- Animated knowledge
  We discover what we know from our world
- Relational knowledge
  We discover what we know in our relations

The idea of pathic knowledge is not new. There has been increased attention given to the phenomenon of embodiment in human action. From a phenomenological point of view it can even be argued that the whole body itself is pathic. Thus "the body knows" how to do things, such that, if we wanted to gain intellectual control of this "knowledge" we might in fact hamper our ability to do the things we are doing—of course, these include routines, habits, conventions, rules, etc. Merleau-Ponty (1964) described the body's knowledge in terms of the access it provides to our world. But it could also be argued that the knowledge does not only inhere in the body but also in the things themselves. Knowledge inheres in the world already, in such a way, that it enables our embodied practices. An alien or disturbed environment may confuse the habituated and confident practices of the body. And thus, in a strange environment or unfamiliar world we may not only feel disoriented but also quite stupid, naive, ignorant. For example, many teachers know how a positive atmosphere, trustful habits, and productive routines seem to be in part a function of the room, the physical space, the social ambience, and the cultural ecology of the school where they feel comfortable and at home so to speak.

In a similar sense it is the case that some of our knowledge resides intangibly in our relations with others. On the one hand, this relational dimension poses limitations upon the degree of reflection and distance one can assume in a conversational or interactional teaching situation. Strictly speaking one's mind is not quite one's own when one is actively involved in social interactions such as speaking together. "Minding someone" or "to give someone a piece of one's mind" are not just empty expressions. The opportunity to reflect on what one says and does while one is saying or doing these things can only be seized at the cost of a certain authenticity of the relation in which one is involved at the time.

On the other hand, relational knowledge can also surprise us. For example, who is not familiar with the peculiar phenomenon that in the presence of one person we may feel totally stupid while in discussion with an other person we may feel really smart? In interactive relations our words seem to be tied up in the total conversational structure of our relation with this other person with whom we speak and to whom we listen. It may happen that we are saying or telling something—and as the words fall from our tongue we hear ourselves speak, and we think, "Not bad!" We may be surprised at our own thought and eloquence. "Did I say that? That's good, I

should write it down!" Thus, Merleau-Ponty can say, "my spoken words surprise me myself and teach me my thought" (1964, p. 88).

Of course, the important question is: but how do we cultivate the pathic dimension of our epistemology of practice? This is where I see the main role of human science studies and especially the process of phenomenological writing. I have suggested that the pathic dimensions of the epistemology of teacher practice are pathic precisely because they reside or resonate in the body, in our relations with others, in the things of our world, and in our very actions. In other words, these are corporeal, relational, situational, and active forms of knowing that cannot always be translated back or captured in conceptualizations and theoretical representations. A pathic language is required. Through a certain kind of writing these pathic forms of knowing may find expression in texts. As readers we become engaged in these texts when they compel our attention and, sooner or later, prompt us to reflect on what has now become a reflective text—this is what Roland Barthes called writerly reading.

In our attentiveness to our lived experiences through the process of reflective writing, texts may sometimes acquire a unique feature: not only does the phenomenological text speak to the head it also speaks to our embodied being. In other words, while traditional research aims to produce a "body of knowledge," phenomenological research aims to produce "body knowledge." One of the aspects of phenomenological inquiry is to gather lived experience descriptions. I have already shown some examples of anecdotes that I continue to solicit from school students and teachers.

Even this seemingly simple activity of anecdote writing can already be quite effective in developing insights into what seem like core elements of teaching practice. The following example of a grade 11 mathematics teacher shows how the very act of writing an experiential account did gradually seem to enhance this teacher's pedagogical thoughtfulness.

> That Friday had begun like any other that month of May. Looking back, not too much stands out other than the grade 11 math class. They were a good bunch of kids. The day before I had given them a major test and most of them had done fairly well but a few had bombed. As I returned the exams I gave a pretty stern lecture about getting serious about school and not slacking off. I recall handing Kevin back his paper, a bad failing mark, and telling him to shape up and get his act together. Kevin didn't say anything; he just looked at me with a distant kind of expression. What else was there to remember? The weekend was uneventful.
>
> But Sunday night I got a phone call from the principal. He wanted me to come over to his place to have a talk. I went over with a little trepidation. I

> couldn't think of anything that I had done wrong. The principal sat me down, poured me a drink, took a deep breath, and informed me that Kevin had committed suicide on Friday night. I slumped in my chair, stunned, not knowing what to say. We just looked at one another. I downed my drink, trying not to show my emotion. The image of Kevin now stood out in sharp relief. I started to remember all of the little things; his daydreaming for which I had reprimanded him; how Kevin had stared at me on Friday; and how he lingered leaving the room. Why hadn't I picked up on those clues? I had to remind myself to remain logical, that his death was not my fault, but there was doubt in my heart.
>
> The next day was one of the most difficult in my life. Kevin's class was my homeroom, the first of the day on Monday. How do you tell a group of 16 and 17 year olds that one of their classmates had killed himself? I told the kids in as few words as possible, trying to keep from choking up. But I couldn't and I cracked in the end, as did many in the class. The strange thing was that when I told them that Kevin was dead, they all looked over at his empty desk, as if they could not believe he was gone. No one sat in that desk again in that class.
>
> The kids and I became very close for the rest of the term. Everyone pulled together and helped one another. One of the students, even went to speak to a counselor. She was worried about me.
>
> (Grade 11 teacher)

As you can imagine, narratives like these prompt many kinds of reflections among teacher practitioners. In our pedagogy seminars we use these stories in order to discuss pedagogical themes or qualities that good teaching seems to require. Sometimes it is not so clear what theme or quality is at stake. I may suggest to the participants that by rewriting a text from a varied and imaginative point of view we actually manipulate experience and thus may bring about a better understanding of what is thematic in the account. So I asked them to re-write their anecdotes, but now from the point of view of an imaginary student in their class. This is how math teacher rewrote his reminiscence, from the perspective of one of the students in Kevin's class.

> (Teacher (re)written "student point-of-view story" of Kevin)
>
> I noticed Kevin just staring at Mr. Hansen as he handed back his test. "This is becoming a pattern. You're going to have to shape up if you want to pass this course Kevin," was the only comment the teacher made. I was sitting right behind Kevin and could see his mark, 30 %. Kevin did not say a word. That wasn't unusual lately as he had been very quiet in class, seeming distant and withdrawn, as if in a constant daydream. The kids all sensed that Kevin was having some kind of trouble but he didn't talk about it to anyone. He just sat in his desk all period, not saying a word, not participating in any of the discussions.

> The rest of the period I kept watching Kevin, wondering what was happening with him. But since I am a girl I did not feel that I could ask him straight out if anything was wrong.
>
> When the bell rang, I noticed that Kevin seemed to hang back a bit, like he wanted to talk to the teacher or something. But Miss Walters had come by and was at the door chatting with Mr. Hansen. As the students filed out, the two teachers stood there talking. Kevin dilly-dallied a bit and Mr. Hansen glanced at him but did not acknowledge him or pay any attention--so finally Kevin just left. I saw their eyes meet as Kevin walked past him through the door. Nothing was said. I packed up my books and as I walked by the teachers I stopped, "I think Kevin wanted to talk to you sir." Mr. Hansen did not really look at me while he replied, "Yeah, well, I'm kind of busy. I'll catch him on Monday. Have a good weekend Mary."
>
> On Monday, when we came into class Mr. Hansen looked very serious, almost distressed. He stood there for a moment. The whole class sensed that something strange was happening. Then tears came to his eyes as the teacher informed us that Kevin had killed himself during the weekend. "I hope that all of you realize that I'm always here for you ... for anything," he said.
>
> I just looked at him.
>
> (Grade 11 teacher)

The effect of rewriting (and fictionalizing from an imagined student point of view) had a dramatic effect. It is as if this rewritten text created a space for a new understanding of the original account. In the discussion that followed, the teacher seemed to feel that he now knew the importance of "being there" for students when it matters. He realized that as a teacher you must be available, not just passively but also actively available by sensing when students need encouragement, a helping hand, some recognition, a listening ear, and so forth.

I should tell you that, when the teacher was halfway reading out loud this fictionalized anecdote, he became so overwrought that he could not read any further. Now this may seem a bit strange because only a week earlier he had read his first draft and, although he described it as a sad incident the math teacher appeared quite sober-minded. Thus, I would be hard pressed dismissing his emotional response as misplaced sentimentality. He simply is not a man given to passionate outbursts. What then touched him to tears this time?

The space of writing

The response to this question may seem to be quaint. My answer would be that it has something to do with the peculiar phenomenology of the activity of writing, inquiry through writing (van Manen, 1990). Writing (and reading too) may transport us to a place away from the noise of ordinary reality. It is here that the unexpressible truths of human existence emerge from their silence. In writing and especially in fictionalizing a sensitive account it may happen that the space opened by the text becomes charged with a signification that is, in effect, more real than real. As readers, many of us know this phenomenon. Many readers have at one time or another been profoundly moved in the realization of being touched by a human insight. And this insight might not have affected us this deeply if we had undergone the experience in the sober light of day, rather than in the twi-light zone of the novel, story, or poem. There is something paradoxical about the unreality of a powerful text: it can be experienced by the writer or reader as real, as unreally real. This super reality turns the insights we gain in the space of the text essentially virtual, unencumbered by the presence of all the other memories, impressions, and factualities that permeate the affairs of our everyday life.

The French philosophers Maurice Blanchot, George Bataille, and Emmanuel Levinas have written about this phenomenon of writing and textuality. Especially Blanchot has extensively examined unsuspected dimensions of the phenomenology of text, of writing and reading. He has shown how the textual space of reading and writing creates a special world—an unworldly world, similar yet foreign to the everyday world. In this textual space the writer dwells alone. "The writer belongs to a language that no one speaks," says Blanchot. But it is precisely because of this feature of textuality that human truth can be brought into immediate presence, into startling nearness.

Just as in a photograph the focal object in a text stands out dramatically against an indeterminate but necessary backdrop of worldly detail, so in a narrative text the evoked signification of pathic sensibility emerges strikingly against the backdrop of necessary but vague particularities and contextualities of descriptive detail and plot.

For Blanchot (1982) as well as for Levinas (1996) the space created in the writing/reading experience of literary text is not only inner space but

also a sort of transcendental space that belongs to language itself. That is why we can speak of the poetic word; and that is why some authors would say that to write is to aim for the line that suddenly stirs us. Thus, the phenomenological image inheres in the poetic power of the proper word, in the sudden resonance of the contingent phrase, in the evocation of the tonality of the text. We might call this physiognomic "face" of text its pathognomy. Why should we be interested in the pathognomic character of texts? Pathognomic texts are those that prompt pathic understanding. The pathic power of texts depend on pathognomic features such as lived throughness, evocation, intensification, tone, and epiphany (van Manen, 1997). Human science in this contemporary sense is highly sensitive to language and to the relation between writing and thinking. Indeed, from a hermeneutic phenomenological point of view "research is writing"—dwelling in that textual space as described by Blanchot (1982), Bachelard (1969), Levinas (1996), and more contemporary proponents of this tradition such as Jean Jacques Derrida (1981) (influenced by Blanchot), and differently Michael Serres (1997) (a student of Bachelard), and again differently by Alphonso Lingis (1994) (influenced by Levinas).

Thus, writing turns phenomenologically evocative when it manages to enter the pathic space of narrative. This is the space in which we dwell when we lose ourselves in the words of a novel, a poem, a story—a literary work. The space evoked by these texts create worlds that are virtual and yet experientially real; in Blanchot's vocabulary, these are unworldly worlds (1995), foreign to the everyday world. Some of us may have puzzled about the exact nature of this space, when we ask questions such as: Where do we go when we enter the space of the text? And how can it be that it is precisely in this space where we sometimes can suffer experiences that are truly pathic, profoundly revealing of human meaning?

Strictly speaking every piece of writing is fictional. As soon as we bring to written language the observed or remembered cognitions of real events and phenomena, the account tends to turn fictional, a version of what we saw or remember. Any experience we narrate becomes fictionalized because it is now purified, torn away from the world to the space of the text, from the millions of other possible significations that also belong to the real world of the event or phenomenon of which we write. And yet, ironically, this purification of meaning that takes place in fiction brings us closer in touch, more immediately in contact with the original sensibility of

the word and the world. That is why a great literary novel or poem can evoke so stirringly the themes of human existence: love, death, bliss, and yes human availability and unavailability and any other kind of lived experience.

Blanchot and Bataille discuss these notion in the context of the great literary works of authors like Kafka, Proust, Artaud, and Rilke. But luckily for us, one does not need to be a great poet or gifted author to create texts that are phenomenologically evocative of lived meaning and thus useful for further research and writing.

I look over some of the writings from students at various grade levels. And I am struck how often they seem to invoke in their descriptions of classroom incidents the question of teacher availability or unavailability, openness or closedness, presence or absence in the teacher-student relation of classroom life and instructional processes. Here is a stark example by a grade 8 student.

> "Sit down or you lose a mark!" shrieked Mrs. K. in a high-pitched voice, as she strutted into the class, fashionably late as usual. "Casey that is two marks already!"
>
> This routine was utterly predictable.
>
> "Okay class, now I've warned you and I am taking attitude marks off anyone who talks. Gordon! That's one. Kelly, that's one. Steven, that's one. Okay, Casey, that's three marks. One more remark like that and you will be in the hallway."
>
> "I may as well leave right now."
>
> "Good idea, get out!"
>
> "Finally!"
>
> "And you can also go and fill out an exclusion form in the office."
>
> The class was now more or less settled down.
>
> "Now here is your assignment: do pages 64 to 67 and put all bold-faced words in your glossary." She glanced at the clock, and then continued, "Well do the checkpoint on page 68 as well. Due next class, so get to work! No talking and no one gets up."
>
> From then on the only sound to be heard was the rasp of the teacher's nail file.
>
> I had difficulty with the assignment. But only after about twenty minutes I had gathered enough courage to approach the teacher.
>
> "Mrs. K. I am not sure I understand this question ..."
>
> "There really is nothing to explain. It is just a simple problem with a little quirk in it. If you don't understand it then see me tomorrow at lunch."
>
> "But it is due tomorrow morning!?"
>
> "Well I guess you will have to talk to someone in your group. Now get back to work."
>
> I got back to my work book.

The nail file resumed its raspy rhythm.

(Grade 8 student)

Here is a teacher who, as experienced by her students, seems to have become hardened, closed, unavailable to them. It is as if she has sealed off an interior capacity and willingness to be sensitive and understanding of her students" difficulties and needs. Presence cannot be adequately described as a concept, but it can be made intelligible through description of simple and immediate experiences. We may all know how some people seem to become immediately present to us while others do not give us that feeling at all. With one person we feel at home, while with another person we may feel awkward. It seems that a person who is truly available to us is present in his or her words and gestures. And more so, this presence is experienced as a shared atmosphere. Someone who is present to me makes it possible for me to discover me to myself.

As another source for phenomenological writing I introduce the seminar participant to the importance of "insight cultivators" that aid in the hermeneutic interpretive process. For example, Gabriel Marcel (1950, 1976, 1978) has written about the phenomenology of availability and unavailability in such a way that it helps us not only to interpret experience but also to further explore other examples of this phenomenon in our seminars and writing.

Insight Cultivators (ICs)

Indices of Unavailability
- Encumbrance
- Crispation
- Susceptibility

Indices of Availability
- Personal presence
- Receptivity

Insight cultivators are often found in the reflective writings of philosophers and other scholars of the humanities and human sciences. They may give us the sense of "I see" and help us (a) to interpret our lived experiences, (b) to recall experiences that seem to exemplify these insight cultivators, and (c) to stimulate further creative insights and understandings with respect to the phenomenon under investigation. Briefly, encumbrance is a kind of self-

absorption; an encumbered person is someone who cannot make room in himself or herself for someone else. A parent who is too preoccupied with a career is just as unavailable as a parent who is preoccupied with personal fitness—both are enchanted by an image or ideal that prevents them from being who they might be for themselves and for the children with whom they share their lives. Crispation is the condition of having become fixated or stale in one's being. Literally one's self has shrunk or shrivelled up like a crustracean animal contracts and withdraws into its shell. The crispated person is someone who has hardened and can no longer be sensitive to others. It is as if the person has sealed off an interior capacity to be perceptive and discerning of other people's interests and needs. Susceptibility is an anxious vulnerability, a certain kind of timidity, fear, shyness, or self-consciousness that makes one blind to the subjectivity of others and unavailable to their vulnerabilities. This may not seem to be common concern in teachers. But the following anecdote by a teacher may not be that unusual:

> After taking attendance I had given the students an information sheet to fill out. The class had been quietly working when Jack sauntered into the room, late as usual. He slouched over to his desk, straddled his seat, dropped his books with a thud, and leaned his chair back toward Gavin, who sat in the desk behind him: "What's up? Do we have a test?"
>
> I watched the scene with some annoyance. Jack was a known troublemaker, rude to his teachers, and mean to his fellow students. In spite of his surliness, he had gained a sort of forced respect from the other kids. It was clear that they half-admired and half-feared him. They would never deny him anything, but they certainly didn't want him as a friend either.
>
> Gavin glanced at me nervously, then at Jack, and shook his head slightly.
>
> I managed to find my voice: "Jack, come here and fill out this form. Please don't bother Gavin." I hated myself at that very moment. I hated the insipid tone of my voice. I hated the way I treated Jack so deferentially in spite of his rudeness and show of disrespect. I knew I was guilty of playing a double standard between him and the other kids, but I didn't seem to know what else to do.
>
> (I need to explain that I was a bit uneasy with Jack. As teachers we had been informed that Jack had beaten up on his parents and that he had been in trouble with the law on possession of weapons' charges and violent behavior. The psychologist had warned us not to provoke the boy because he was emotionally unstable and potentially armed. As his teachers, our only recourse was to be attentive and to "buzz the office immediately if Jack seemed to have something on him.")
>
> I picked up a sheet and motioned the boy forward with a nod. He sauntered to the front of the class and reached out. For a moment we stood, facing each other, holding on to either side of the paper. I struggled unsuccessfully to suppress the slight tremor in my hand and then looked at him straight. His eyes held mine for

a moment before a slow, smug grin spread across his face as he pulled the paper from my weak grasp.

He knew.

(Grade 9 teacher)

A teacher's susceptibility to the experience of an anxious vulnerability may prevents him or her from the readiness to deal appropriately with a student.

Now I have just begun to open up the topic of the pedagogy of availability. More study is needed. But I hope that these examples make clear that pathic dimensions of our epistemology of practice cannot easily be clarified with concepts or teaching models. We cannot teach people the practice of availability by discussing or explaining rules for behavior.

I would now like to provide a final example to show how recently a seminar participant first reminisced about her own sense of becoming so encumbered with her job that she became strangely unavailable to her former colleagues and friends. This is an example of unavailability is in the context of adult relations.

I was quite thrilled to be promoted to supervisor in my district. I became responsible for overseeing the work of many people. But soon I became vaguely aware that I was changing. I noticed it especially in my voice. This came as something of a surprise since I did not seem able to alter the bossy tone in my speaking even if I tried. I heard my own voice as assertive, but insincere, inauthentic. Thinking back, it was a very strange sensation, as if I was observing myself while trying to be normal. This change affected me at work as well as in other settings. But I was too busy to really think about it. It seems that it became especially disturbing during lunch time when I would go out with friends, with some of whom I used to have wonderful and intimate conversations.

Conversations became more artificial. It seemed that I was unable to put myself into my own words, enter my own voice. And yet, at the time it was more a subsidiary awareness that, in terms of my presence in the company of others, I was not the same person I used to be.

One day, at lunch time, my long time friend Brenda was telling me about one of her children; I can hardly remember the details. But suddenly she stopped and said, ÒAnn, what is the matter with you?"

I startled, "Nothing, what do you mean?"

"I don't know. You seem to have become so ... distant. Like a stranger almost. Why can't we be like before?"

As I got ready to leave I muttered that I did not know what she was talking about, but in my heart I knew that she was right. Something had changed. Since then Brenda and I did not talk much anymore.

I never discussed these occurrences with anyone, perhaps because I did not quite know how to talk about something so private.

After about ten years I quit my supervisor job. But it took me until today—now I am writing this—that I begin to understand what had been happening to me.

> Writing this has made me more available and present to myself.
> (Seminar participant)

This last line nicely sums up the main theme of my talk. But, of course, not all writing has this pathic effect. It seems that few educational discourses and research approaches reflexively make the textual space the location for the vocative dimensions of inquiry. Writing is not just externalizing internal knowledge, rather it is the very act of making contact with the things of our world. In this sense to do research is to write and the insights achieved depend on the right words and phrases, on styles and traditions, on metaphor and figures of speech, on argument and poetic image. Even then, writing can mean both insight or illusion. And these are values that cannot be decided, fixed or settled since the one always implies, hints at, or complicates the other (Derrida, 1981). But perhaps openness and availability in text is just as valuable as openness and availability in pedagogical relations. Openness—in the sense of interpretive availability—is a sustaining motive of all qualitative inquiry. Such inquiry is based on the idea that no interpretation is ever complete, no explication of meaning is ever final, no insight is beyond challenge. It behooves us to remain as attentive as possible to the ways that children, teachers, and all of us experience the world and to the infinite variety of possible human experiences and possible explications of those experiences.

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addendum

Current approaches to school & teaching practice

Name	*Model*	*Orientation*	*Key Concern*
Corporatist	**business**	**organization**	**budget**
Teacher as business person: student as customer			
Managerialist	**leadership**	**effectiveness**	**achievement**
Teacher as leader or follower or team player: student as worker			
Productionist	**industrial**	**outcomes**	**profit**
Teacher as producer: student as product			
Consumerist	**economic**	**choice**	**satisfaction**
Teacher as service provider: student as customer			
Cognitivist	**psychological**	**constructivist**	**reflectivity**
Teacher as enactive: student as shaper of personal meaning			
Technicist	**science**	**problem solving**	**efficacy**
Teacher as technician or expert: student as solution user			
Aestheticist	**fine arts.crafts**	**artistic**	**performance**
Teacher as creator or performer: student as "work"			
Criticist	**analytic**	**theory**	**polemical**
Teacher as change agent: student as self-cultivating			
Postmodernist	**discourse**	**culture**	**desire**
Teacher as author: student as text			
Civicist	**democracy**	**social action**	**responsibility**
Teacher as political agent: student as new citizen of pluralist society			
Ethicist	**moral**	**value**	**normativity**
Teacher as moral agent: student as moral person			

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